IEI Technology Corp.

MODEL:

TANK-720

High Performance Fanless Embedded System with
2nd Gen Intel® Core™ i7/i5/i3, Celeron® and Pentium® desktop processors,
On-board 2.0 GB DDR3 Memory, VGA/HDMI, USB 3.0, Dual Combo (SFP
Fiber/RJ-45) Gigabit LAN, Isolated CAN-bus, Audio and RoHS Compliant

User Manual

Rev. 2.00 – 28 April 2013

RoHS Lead Free

Revision

Date	Version	Changes
28 April 2013	2.00	Update Section 3.2: Hard Disk Drive (HDD) Installation
20 February 2013	1.03	Update Section 3.9.11: Remote Control Terminal Block
21 June 2012	1.02	Update the system memory capacity
12 March 2012	1.01	Update the pictures for TANK-720
25 October 2011	1.00	Initial release

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WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/ TV technician for help.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: TANK-720

The TANK-720 Series fanless embedded system is powered by the 2nd Generation Intel® Core™ i7/i5/i3 and Pentium®/Celeron® desktop processor, uses the Intel® Q67 chipset and has 2.0 GB of DDR3 memory. It supports dual display via VGA and HDMI. Two SATA 6Gb/s, two USB 3.0 and four USB 2.0 ports provide flexible expansion options. Serial device connectivity is provided by six RS-232 and two RS-422/485 ports.

1.2 Model Variations

The model variations of the TANK-720 Series are listed below.

Model No.	8-Channel Audio/Video Capture Card	802.11a/b/g/n 3T3R Wi-Fi
TANK-720-Q67/C/2G-R10	Yes	No
TANK-720-Q67/2G-R10	No	No
TANK-720-Q67W/C/2G-R10	Yes	Yes
TANK-720-Q67W/2G-R10	No	Yes

Table 1-1: TANK-720 Model Variations

1.3 Features

The TANK-720 features are listed below:

- 2nd Gen Intel® Core™ i7/i5/i3 and Pentium®/Celeron® desktop processor
- Intel® HD graphics supports H.264/AVC-MPEG2/VC1, DirectX 10.1 and OpenGL 3.0
- 2.0 GB of DDR3 SDRAM SO-DIMM preinstalled
- Dual combo (10/100/1000 baseT(X) or 1000 baseSPF slot) Gigabit LAN ports with Intel® AMT 7.0 support
- 8-channel audio/video capture support
- Dual display via VGA and HDMI
- Two USB 3.0 ports
- Four USB 2.0 ports
- Two SATA 6Gb/s ports
- Eight COM ports (four with isolation)
- Dual-band 2.4/5 GHz 802.11a/b/g/n 3T3R MIMO Wi-Fi for high speed wireless transmission
- Redundant dual DC power input (9V~36V)
- CAN-bus interface with isolation

1.4 Technical Specifications

The TANK-720 technical specifications are listed in **Table 1-2**.

Specifications	
System	
CPU	2nd Generation Intel® Core™ i7/i5/i3 and Pentium®/Celeron® desktop processor
Chipset	Intel® Q67
Memory	1 x 204-pin 1066/1333 MHz dual-channel DDR3 SDRAM SO-DIMM slot (system max. 10GB) 2.0 GB of DDR3 memory preinstalled
Ethernet Controller	Intel® 82579 PHY with Intel® AMT 7.0 support Intel® 82583V Ethernet controller

Specifications	
I/O and Indicators	
Ethernet	2 x Combo (SFP Fiber/RJ-45) Gigabit LAN
RS-232	4 x DB-9 serial ports on rear panel 2 x RJ-45 serial ports with isolation on front panel
RS-422/RS-485	2 x RJ-45 serial ports with isolation on front panel
USB Interfaces	2 x USB 3.0 ports on front panel 4 x USB 2.0 ports on rear panel
Display	1 x VGA port 1 x HDMI port Supports resolution up to 2048x1536 @ 75Hz (VGA), 1920x1200 @ 60Hz (HDMI)
Audio Connector	1 x Line-out port 1 x Mic-in port
CAN-bus	1 x Phoenix terminal block on front panel
Audio/Video Capture	Optional 4-channel audio/video input PCIe Mini card (up to two cards)
Digital I/O	1 x DIO port (8 bits)
LED Indicators	AT power mode LED ATX power mode LED CAN-bus LED CPU temperature alert LED HDD LED LAN 1 LED LAN 2 LED Power 1 LED Power 2 LED SFP 1 LED SFP 2 LED Wi-Fi LED
Storage	

Specifications	
SATA	2 x SATA 6Gb/s with 2.5” HDD/SSD support
Power	
Power Adapter	90W power adapter Input: 100V AC~240V AC, 50/60 Hz Output: 19V DC
Power Supply	Redundant dual DC input Power 1: 9V (+/-3%) ~ 36V Power 2: 10.5V (+/-3%) ~36 V
Power Consumption	19V@3.1A (Intel® Core™ i3-2100T processor 4G DDR3 memory)
Environmental and Mechanical	
Operating Temperature	-20°C~50°C, 5%~95%, non-condensing
Storage Temperature	-30°C~80°C
Mounting	Desktop, Wall mount
Color	Black C + Silver C
Weight (Net/Gross)	4.2 Kg / 6.9 Kg
Physical Dimensions	310 mm x 200 mm x 70 mm (W x D x H)

Table 1-2: Technical Specifications

1.5 Connector Panel

1.5.1 Front Panel

The TANK-720 front panel contains:

- 2 x 4-channel audio/video input (Optional)
- 1 x CAN-bus terminal block with isolation
- 12 x LED indicators
- 1 x Power button
- 2 x RS-232 serial ports with isolation
- 2 x RS-422/485 serial ports with isolation
- 2 x USB 3.0 ports

- 2 x Wi-Fi antenna connectors

An overview of the front panel is shown in **Figure 1-2**.

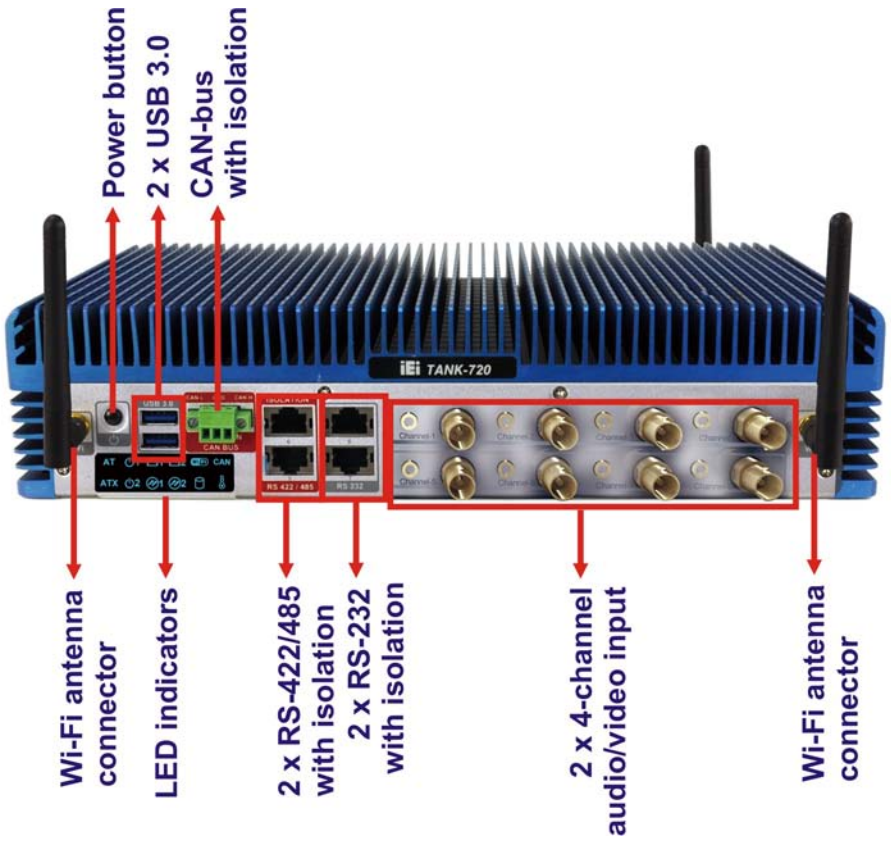


Figure 1-2: TANK-720 Front Panel

1.5.2 Rear Panel

The TANK-720 rear panel contains:

- 1 x DIO port
- 1 x HDMI port
- 1 x Line-out port (green)
- 1 x Mic-in port (pink)
- 1 x 4-pin power jack for 10.5V (+/-3%) ~ 36V power input
- 1 x 4-pin terminal block for 9V (+/-3%) ~ 36V power input
- 1 x 2-pin terminal block for remote control
- 1 x Reset button

- 2 x RJ-45 combo Gigabit LAN ports
- 4 x RS-232 serial ports
- 2 x SFP Fiber combo Gigabit LAN ports
- 4 x USB 2.0 ports
- 1 x VGA port
- 1 x Wi-Fi antenna connector

An overview of the rear panel is shown in **Figure 1-3** below.

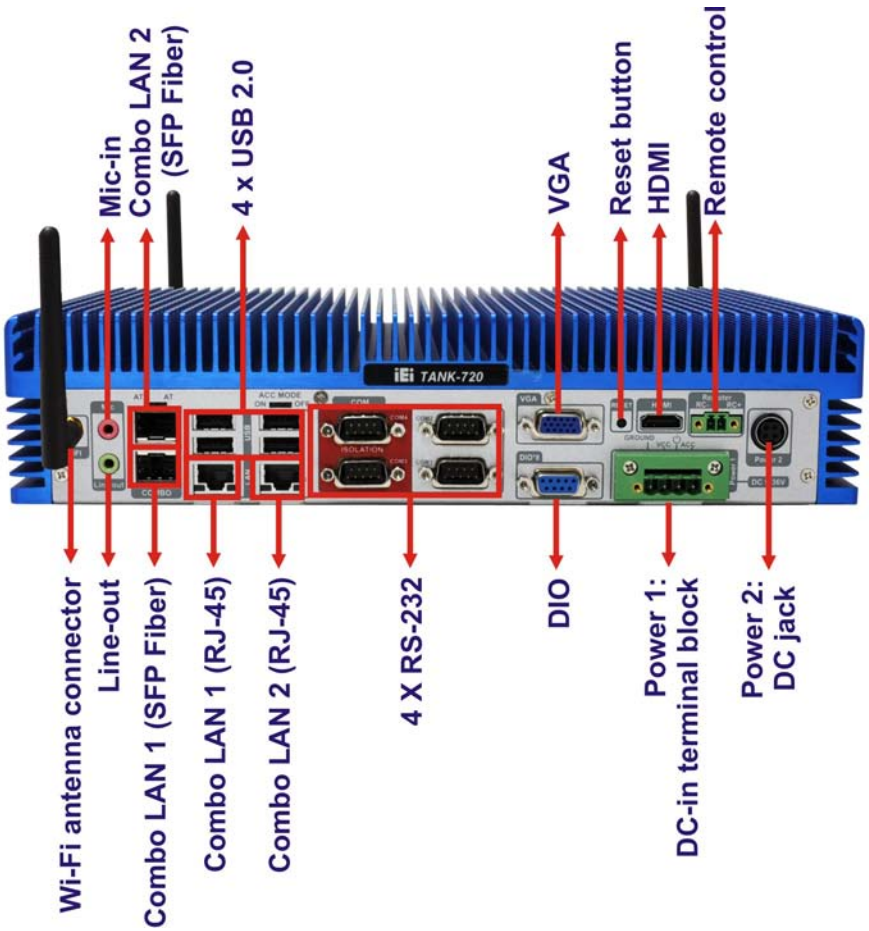


Figure 1-3: TANK-720 Rear Panel

NOTE:

The TANK-720 provides two pairs of combo LANs. For each pair of combo LAN, only one LAN port can work at one time, and the SFP Fiber port works prior to the RJ-45 one. When a LAN port is working, the corresponding LED indicator lights up. Refer to **Section 1.6** for the locations of the LED indicators.

1.6 LED Indicators

There are several indicators on the front panel of the TANK-720 as shown in **Figure 1-4**.

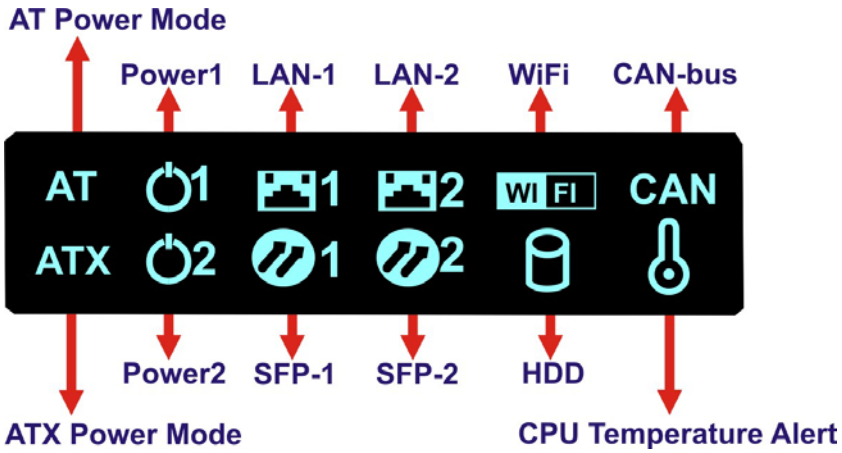


Figure 1-4: TANK-720 LED Indicators

WARNING:

The CPU Temperature Alert LED turns red when the CPU temperature is too high. If this situation occurs, lower the environment temperature or close some running applications to cool down the CPU.

1.7 Dimensions

The physical dimensions are shown below:

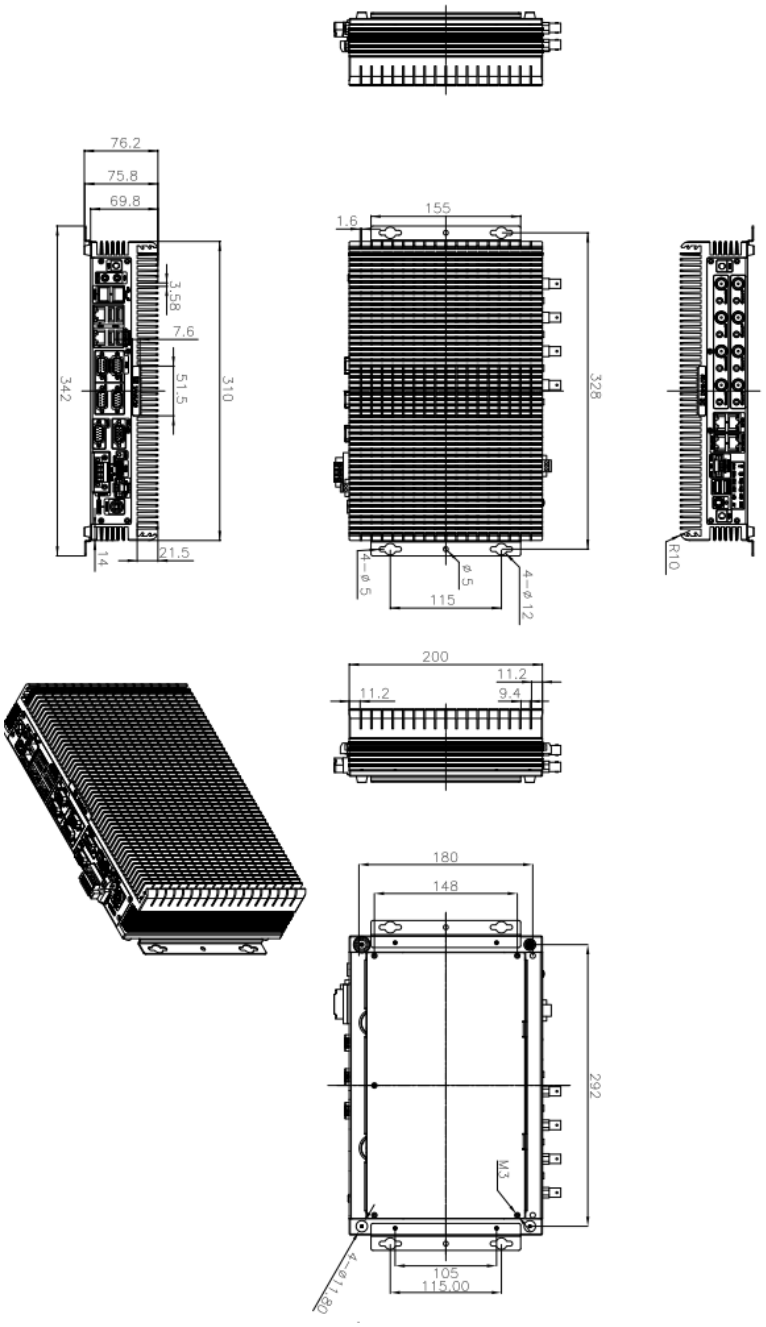


Figure 1-5: Physical Dimensions (mm)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-720 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-720. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-720 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Touch any grounded conducting material before handling the board. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the TANK-720, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-720.

2.2 Unpacking Precautions

When the TANK-720 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the TANK-720 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the TANK-720 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The TANK-720 is shipped with the following components:

Quantity	Item and Part Number	Image
Standard		
1	TANK-720 Series	
1	Power adapter (**P/N**: 63040-010090-020-RS)	
1	Power cord (**P/N**: 32702-000401-100-RS)	
1	Power cord convert cable (**P/N**: 32702-000300-100-RS)	
2	Mounting brackets (**P/N**: 41020-0163J4-00-RS)	
8	Mounting brackets screw (**P/N**: 44033-030062-RS)	

Quantity	Item and Part Number	Image
Standard		
8	Chassis screw (**P/N**: 44013-030041-RS)	
4	RJ-45 to DB-9 COM port cable (**P/N**: 32005-000200-200-RS)	
3	Wi-Fi antenna (for Wi-Fi module only) (**P/N**: 32505-000900-100-RS)	
1	Pluggable DC-in terminal block (**P/N**: 33502-000055-RS)	
1	Pluggable CAN-bus terminal block (**P/N**: 33502-000007-RS)	
1	Pluggable remote control terminal block (**P/N**: 33101-000422-RS)	
1	User manual and driver CD	
1	One Key Recovery CD	
2	Thermal pad (**P/N**: 34100-000255-RS)	
1	Thermal pad (**P/N**: 34100-000261-RS)	

The following table lists the optional items that can be purchased separately.

Optional	
Gigabit Ethernet SFP module (**P/N**: SFP1G-SX/-I SFP1G-MLX/-I SFP1G-LX10/-I SFP1G-ZX70/-I)	
Fiber cord (**P/N**: FPC-LCLC-MM3M FPC-LCLC-SS3M)	
OS: Win CE 6.0 (CDROM) (**P/N**: TANK-720-Q67-CE060-R10)	
OS: Win XPE (CDROM) (**P/N**: TANK-720-Q67-XPE-R10)	
OS: Linux (CDROM) (**P/N**: TANK-720-Q67-LNX-R10)	
OS: Win 7 Embedded (CDROM) (**P/N**: TANK-720-Q67-WES7E-R10)	

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the TANK-720, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-720 must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the TANK-720 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-720 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the TANK-720. The TANK-720's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the TANK-720. Leave at least 5 cm of clearance around the TANK-720 to prevent overheating.
- **Grounding**: The TANK-720 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the TANK-720.

3.2 Hard Disk Drive (HDD) Installation

To install the hard drive, please follow the steps below:

Step 1: Remove the bottom panel by removing the five retention screws from the bottom panel.

Figure 3-1: Bottom Panel Retention Screws

Step 2: Remove the four HDD bracket retention screws and unplug the SATA signal and power cables connected to the TANK-720. And then lift the HDD bracket out of the TANK-720 and put it on a flat surface.

Figure 3-2: HDD Bracket Retention Screws

Step 3: Attach each HDD to the HDD bracket, and then slide each HDD to connect the SATA connectors.

Figure 3-3: HDD Installation

Step 4: Secure each HDD with the HDD bracket by four retention screws (eight in all).

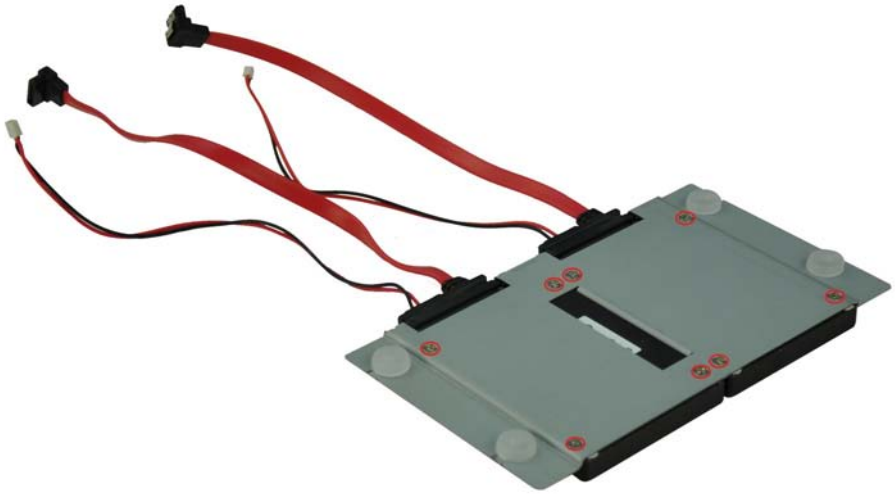


Figure 3-4: HDD Retention Screws

Step 5: Secure the HDD bracket with TANK-720 by the four retention screws that were previously removed.

Step 6: Reconnect the SATA signal and power cables to the TANK-720.

Step 7: Reinstall the bottom panel to the TANK-720.

3.3 Pluggable CAN-bus Terminal Block Installation

To install the pluggable CAN-bus terminal block, please follow the steps below:

Step 1: Locate the CAN-bus terminal block connector. The location of the connector is shown in **Figure 1-2**.

Step 2: Align the pluggable CAN-bus terminal block with the CAN-bus terminal block connector on the TANK-720.

Step 3: Once aligned, insert the pluggable CAN-bus terminal block into the CAN-bus terminal block connector.

Step 4: Secure the pluggable CAN-bus terminal block to the external interface by tightening the two retention screws on either side of the terminal block (**Figure 3-5**).

Figure 3-5: Pluggable CAN-bus Terminal Block Installation

3.4 Pluggable DC-In Terminal Block Installation

To install the pluggable DC-in terminal block, please follow the steps below:

Step 1: Locate the DC-in terminal block connector. The location of the connector is shown in **Figure 1-3**.

Step 2: Align the pluggable DC-in terminal block with the DC-in terminal block connector on the TANK-720.

Step 3: Once aligned, insert the pluggable DC-in terminal block into the DC-in terminal block connector.

Step 4: Secure the pluggable DC-in terminal block to the external interface by tightening the two retention screws on either side of the terminal block (**Figure 3-6**).

Figure 3-6: Pluggable DC-in Terminal Block Installation

3.5 Pluggable Remote Control Terminal Block Installation

To install the pluggable remote control terminal block, please follow the steps below:

Step 1: Locate the remote control terminal block connector. The location of the connector is shown in **Figure 1-3**.

Step 2: Align the pluggable remote control terminal block with the remote control terminal block connector on the TANK-720.

Step 3: Once aligned, insert the pluggable remote control terminal block into the remote control terminal block connector.

Step 4: Secure the pluggable remote control terminal block to the external interface by tightening the two retention screws on either side of the terminal block (**Figure 3-7**).

Figure 3-7: Pluggable Remote Control Terminal Block Installation

3.6 SFP Module Installation

To install an SFP module, please follow the steps below:

Step 1: Locate the SFP fiber connectors. The locations of the connectors are shown in **Figure 1-3**.

Step 2: Align the SFP module with one of the SFP fiber connectors on the TANK-720 (**Figure 3-8**).

Step 3: Once aligned, slide the SFP module into place (**Figure 3-8**).

Figure 3-8: SFP Module Installation

3.7 SO-DIMM Installation

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the TANK-720. Please make sure the purchased SO-DIMM complies with the memory specifications of the TANK-720.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below.

Step 1: Remove the bottom panel by removing the five retention screws from the bottom panel (**Figure 3-1**).

Step 2: Unplug the SATA signal and power cables connected to the TANK-720, and then place the bottom panel on a flat surface.

Step 3: Locate the SO-DIMM socket on the motherboard (**Figure 3-9**).

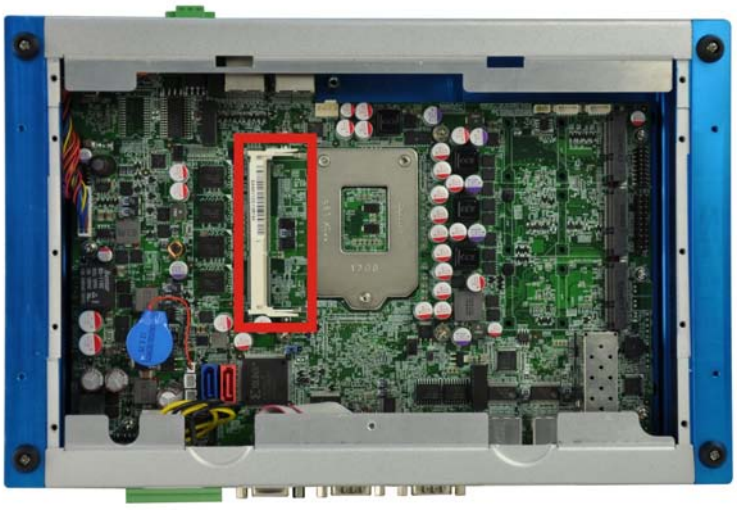


Figure 3-9: SO-DIMM Socket

Step 4: Align the SO-DIMM with the socket. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (**Figure 3-10**).

Step 5: Push the SO-DIMM into the socket at an angle (**Figure 3-10**).

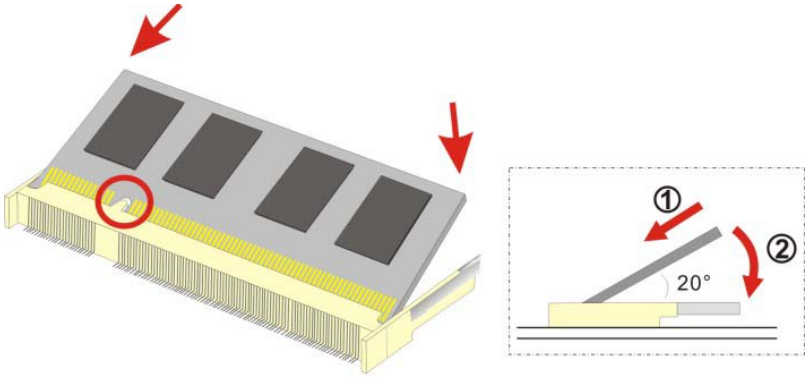


Figure 3-10: SO-DIMM Installation

Step 6: Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down (**Figure 3-10**).

Step 7: Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

Step 8: Install the bracket that was previously removed in the same position it was before.

Step 9: Reinstall the bottom panel to the TANK-720.

3.8 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface (**Figure 3-11**).

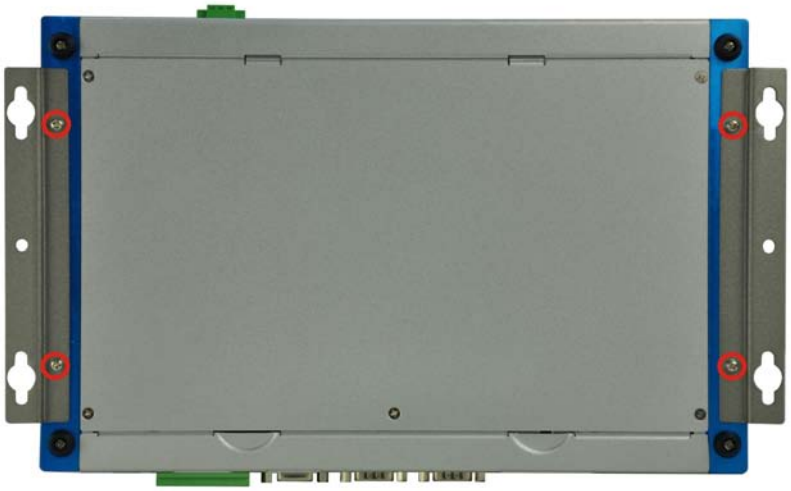


Figure 3-11: Mounting Bracket Retention Screws

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket (**Figure 3-11**).

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

3.9 External Peripheral Interface Connectors

The TANK-720 has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- ACC mode switch
- AT/ATX power mode switch
- Audio connector
- Audio/video input connectors
- CAN-bus terminal block
- Digital I/O connector
- HDMI connector
- LAN connectors

- Power button
- Power input terminal block
- Power input DIN connector
- Remote control terminal block
- RS-232 serial port connectors
- RS-422/485 serial port connectors
- SFP Fiber connectors
- USB connectors
- VGA connectors

3.9.1 ACC Mode Switch

The TANK-720 allows turning the ACC mode on or off. The setting can be made through the ACC mode switch on the rear panel as shown below.

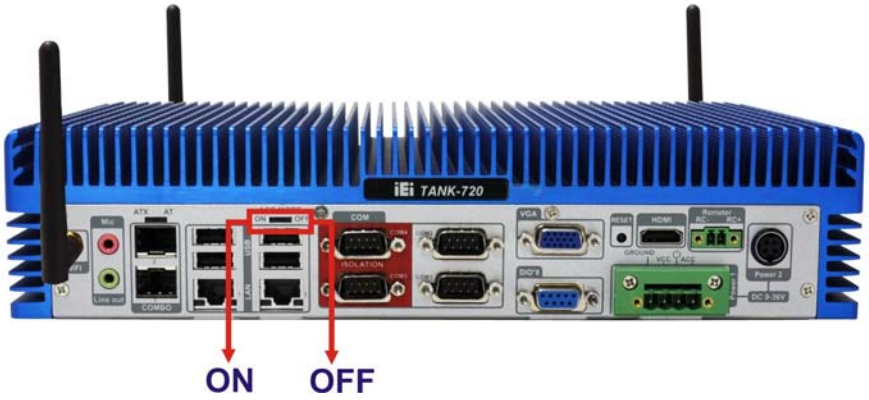


Figure 3-12: ACC Mode Switch

3.9.2 AT/ATX Power Mode Switch

The TANK-720 supports AT and ATX power modes. The setting can be made through the AT/ATX power mode switch on the rear panel as shown below.

Figure 3-13: AT/ATX Power Mode Switch

3.9.3 Audio Connector

CN Label:	Line out and Mic
CN Type:	Audio jack
CN Location:	See **Figure 3-14**

The audio jacks connect to external audio devices.

- **Microphone (Pink):** Connects a microphone.
- **Line Out port (Green):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.

Figure 3-14: Audio Connector

3.9.4 Audio/Video Input Connectors

The TANK-720 can support up to eight video inputs and eight audio inputs through the BNC and RCA connectors on the front panel. The locations of the connectors are shown in **Figure 1-2**.

3.9.5 CAN-bus Terminal Block

There is one 3-pin CAN-bus terminal block. The pinouts are shown in **Figure 3-15**

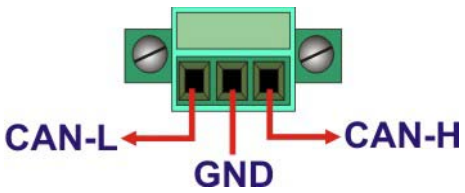


Figure 3-15: CAN-bus Terminal Block Pinouts

3.9.6 Digital I/O Connector

CN Label: **DIO x 8**

CN Type: DB-9 male connector

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-1** and **Figure 3-16**

The digital I/O connector provides programmable input and output for external devices. The pinouts for the digital I/O connector are listed in the table below.

Pin	Description	Pin	Description
1	DIN0	6	DOUT2
2	DOUT0	7	DIN3
3	DIN1	8	DOUT3
4	DOUT1	9	VCC5
5	DIN2		

Table 3-1: Digital I/O Connector Pinouts

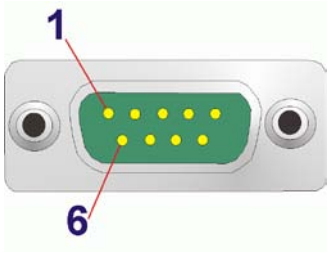


Figure 3-16: Digital I/O Connector Pinout Location

3.9.7 HDMI Connector

CN Label: **HDMI**

CN Type: HDMI type A connector

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-2**

The HDMI (High-Definition Multimedia Interface) connector connects to digital audio or video sources.

Pin	Description	Pin	Description
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5V
19	HDMI_HPD	20	HDMI_GND
21	HDMI_GND	22	HDMI_GND
23	HDMI_GND		

Table 3-2: HDMI Connector Pinouts

3.9.8 LAN Connectors

CN Label: **LAN**

CN Type: RJ-45

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-3**

The LAN connectors allow connection to an external network.

Step 1: **Locate the RJ-45 connectors.** The locations of the RJ-45 connectors are shown in **Figure 1-3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-720. See **Figure 3-17**.

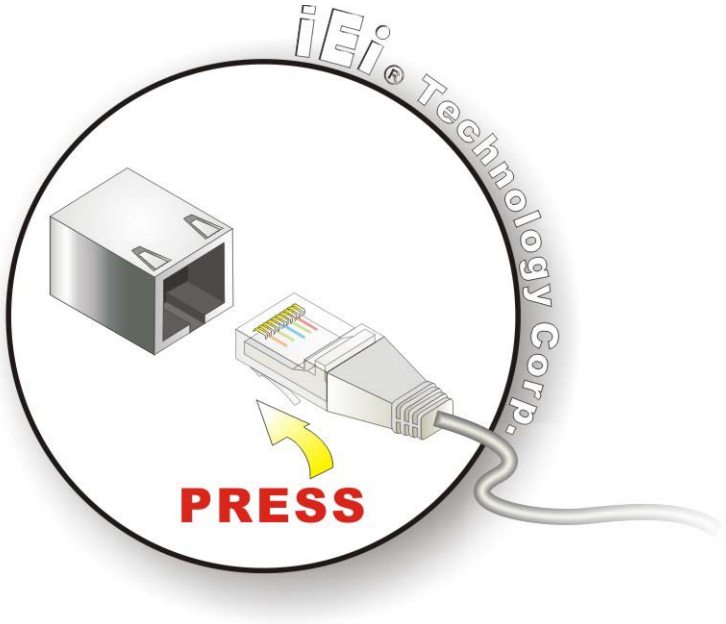


Figure 3-17: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

Pin	Description	Pin	Description
1	TRD1P0	5	TRD1P2
2	TRD1N0	6	TRD1N2
3.	TRD1P1	7	TRD1P3
4.	TRD1N1	8	TRD1N3

Table 3-3: LAN Pinouts

Figure 3-18: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-4**.

Activity/Link LED		Speed LED	
STATUS	**DESCRIPTION**	**STATUS**	**DESCRIPTION**
Off	No link	Off	10 Mbps connection
Yellow	Linked	Green	100 Mbps connection
Blinking	TX/RX activity	Orange	1 Gbps connection

Table 3-4: RJ-45 Ethernet Connector LEDs

3.9.9 Power Input, 4-pin Terminal Block

CN Label: **POWER 1**

CN Type: 4-pin terminal block

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-5** and **Figure 3-19**

Connect the leads of a 9V~36V DC power supply into the terminal block. Make sure that the power and ground wires are attached to the correct sockets of the connector.

Pin	Description	Pin	Description
1	GND	3	Power button
2	VCC	4	ACC

Table 3-5: 4-pin Terminal Block Pinouts

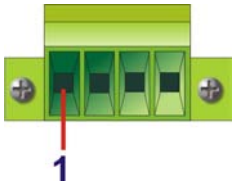


Figure 3-19: 4-pin Terminal Block Pinout Location

3.9.10 Power Input, 4-pin DIN Connector

CN Label: POWER 2

CN Type: 4-pin DIN connector

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-6** and **Figure 3-20**

The power connector connects to the 10.5V~36V DC power adapter.

Figure 3-20: Power Input Connector

Pin	Description	Pin	Description
1	+12V	3	+12V
2	GND	4	GND

Table 3-6: Power Input Pinouts

3.9.11 Remote Control Terminal Block (For AT Power Mode Only)

CN Label: **Remoter**

CN Type: 2-pin terminal block

CN Location: See **Figure 1-3**

CN Pinouts: See **Figure 3-21**

The 2-pin terminal block connects to a remote control device. Users can control the system power on/off by inputting high or low voltage into the terminal block.

- **Turn off** the system: **2 V ~ 5 V** input
- **Turn on** the system: **less than 0.4 V** input

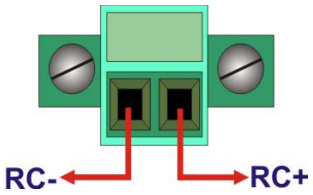


Figure 3-21: Remote Control Terminal Block Pinout Location

3.9.12 RJ-45 RS-232 Serial Port Connectors

CN Label:	**RS 232**
CN Type:	RJ-45
CN Location:	See **Figure 1-2**
CN Pinouts:	See **Table 3-7**, **Table 3-8**, **Figure 3-23** and **Figure 3-24**

RS-232 serial port devices can be attached to the RJ-45 RS-232 serial ports on the front panel.

Step 1: Locate the RJ-45 RS-232 connectors. The locations of the RJ-45 RS-232 connectors are shown in Figure 1-2.

Step 2: **Insert the RJ-45 connector**. Insert the RJ-45 connector on the RJ-45 to DB-9 COM port cable to one of the RJ-45 RS-232 connectors on the TANK-720. See **Figure 3-22**.

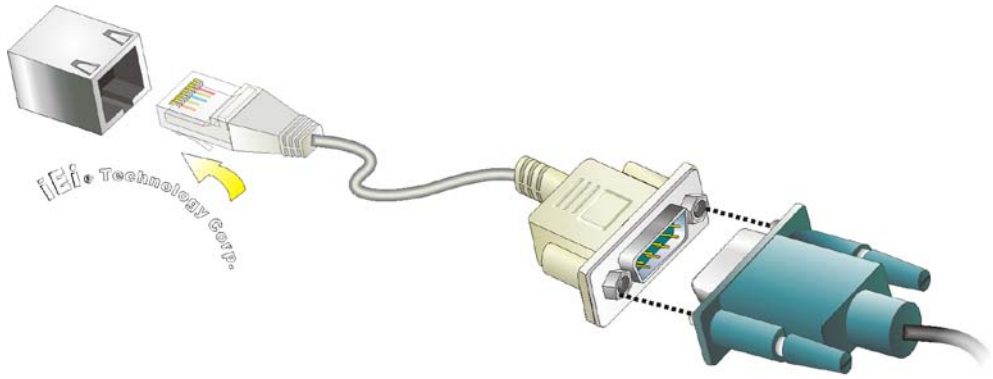


Figure 3-22: RJ-45 RS-232 Serial Device Connection

Step 3: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the RJ-45 to DB-9 COM port cable.

Step 4: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

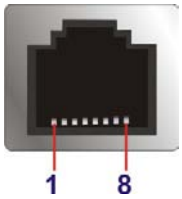


Figure 3-23: RJ-45 RS-232 Serial Port Pinout Location

Pin	Description	Pin	Description
1	RI	5	RTS
2	DTR	6	RX
3.	CTS	7	DSR
4.	TX	8	DCD

Table 3-7: RJ-45 RS-232 Serial Port Pinouts

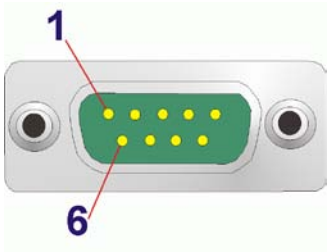


Figure 3-24: DB-9 Connector Pinout Location

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-8: DB-9 Connector Pinouts

3.9.13 RJ-45 RS-422/485 Serial Port Connectors

CN Label:	**RS 422/485**
CN Type:	RJ-45
CN Location:	See **Figure 1-2**
CN Pinouts:	See **Table 3-9**, **Table 3-10**, **Figure 3-26** and **Figure 3-27**

RS-422/485 serial port devices can be attached to the RJ-45 RS-422/485 serial ports on the front panel.

Step 1: Locate the RJ-45 RS-422/485 connectors. The locations of the RJ-45 RS-422/485 connectors are shown in Figure 1-2.

Step 2: **Insert the RJ-45 connector**. Insert the RJ-45 connector on the RJ-45 to DB-9 COM port cable to one of the RJ-45 RS-422/485 connectors on the TANK-720. See **Figure 3-25**.

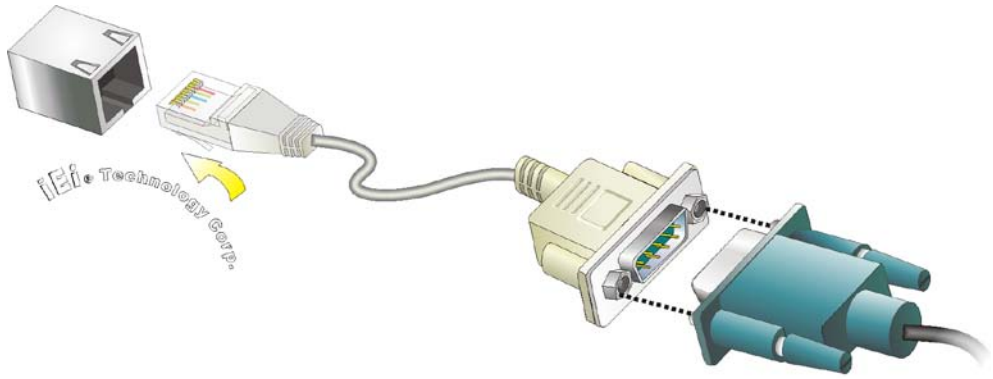


Figure 3-25: RJ-45 RS-422/485 Serial Device Connection

Step 3: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the RJ-45 to DB-9 COM port cable.

Step 4: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

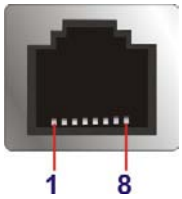


Figure 3-26: RJ-45 RS-422/485 Serial Port Pinout Location

Pin	Description	Pin	Description
1	N/A	5	N/A
2	TXD485#	6	RXD485#
3.	N/A	7	N/A
4.	TXD485+	8	RXD485+

Table 3-9: RJ-45 RS-422/485 Serial Port Pinouts

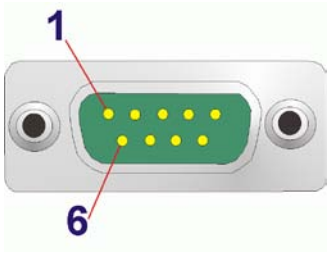


Figure 3-27: DB-9 Connector Pinout Location

Pin	Description (RS-422)	Description (RS-485)
1	RXD422+	N/A
2	RXD422#	N/A
3	TXD422+	TXD485+
4	TXD422#	TXD485#
5	GND	GND
6	N/A	N/A
7	N/A	N/A
8	N/A	N/A
9	N/A	N/A

Table 3-10: DB-9 Connector Pinouts

3.9.14 RS-232 Serial Port Connectors

CN Label:	**COM1**, **COM2**, **COM3** and **COM4**
CN Type:	DB-9 connectors
CN Location:	See **Figure 1-3**
CN Pinouts:	See **Table 3-11** and **Figure 3-29**

RS-232 serial port devices can be attached to the RS-232 serial ports on the rear panel.

Step 1: **Locate the DB-9 connector**. The locations of the DB-9 connectors are shown in **Figure 1-3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 3-28**.

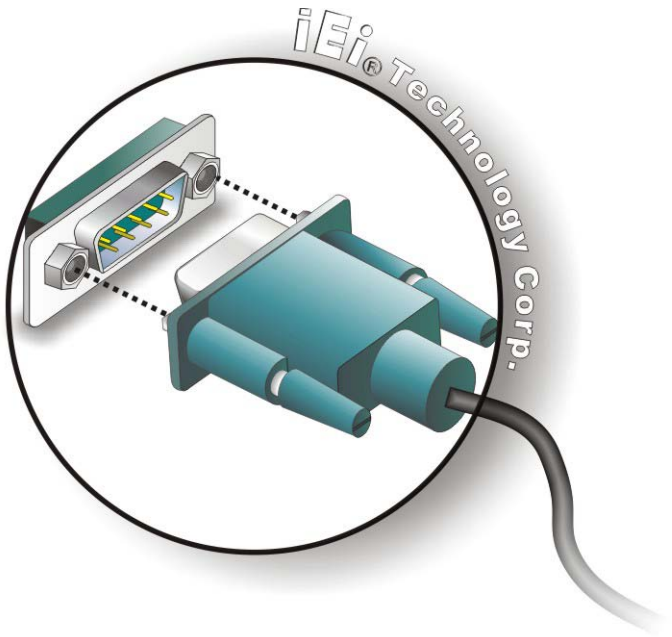


Figure 3-28: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-11: Serial Port Pinouts

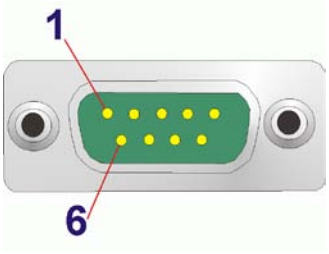


Figure 3-29: Serial Port Pinout Location

3.9.15 SFP Fiber Connectors

The TANK-720 has two SFP fiber connectors. The locations of the connectors are shown in **Figure 1-3**. To install an SFP module, refer to **Section 3.6**.

3.9.16 USB Connectors

CN Label: USB

CN Type: USB port

CN Location: See **Figure 1-2** and **Figure 1-3**

CN Pinouts: See **Table 3-12**

The USB ports are for connecting USB peripheral devices to the system.

Step 1: **Locate the USB connectors**. The locations of the USB connectors are shown in **Figure 1-3**.

Step 2: **Align the connectors**. Align the USB device connector with one of the connectors. See **Figure 3-30**.

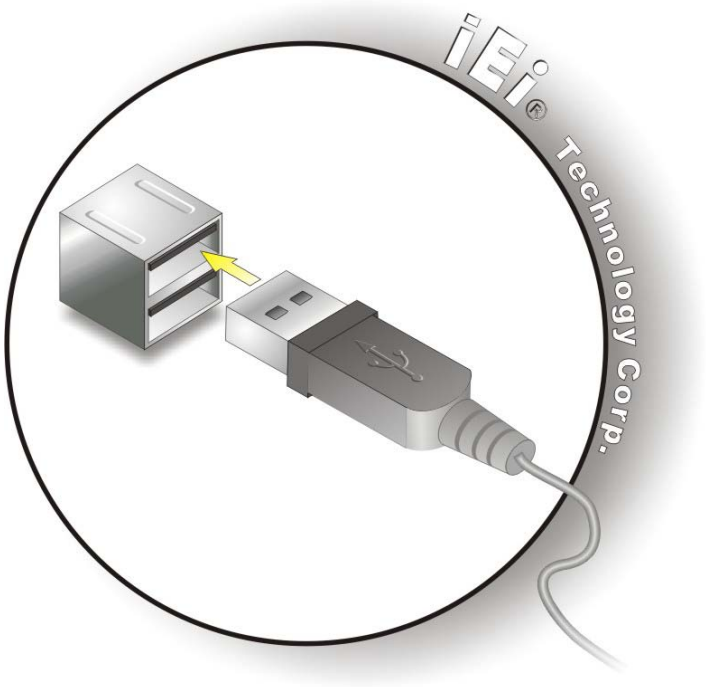


Figure 3-30: USB Device Connection

Step 3: **Insert the device connector**. Once aligned, gently insert the USB device connector into the USB connector on the TANK-720.

Pin	Description	Pin	Description
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GROUND	8	GROUND

Table 3-12: USB Port Pinouts

3.9.17 VGA Connector

CN Label: VGA

CN Type: 15-pin Female

CN Location: See **Figure 1-3**

CN Pinouts: See **Figure 3-32** and **Table 3-13**

The VGA connector connects to a monitor that accepts VGA video input.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Figure 1-3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with, insert the male connector from the VGA screen cable into the female connector on the TANK-720. See **Figure 3-31**.

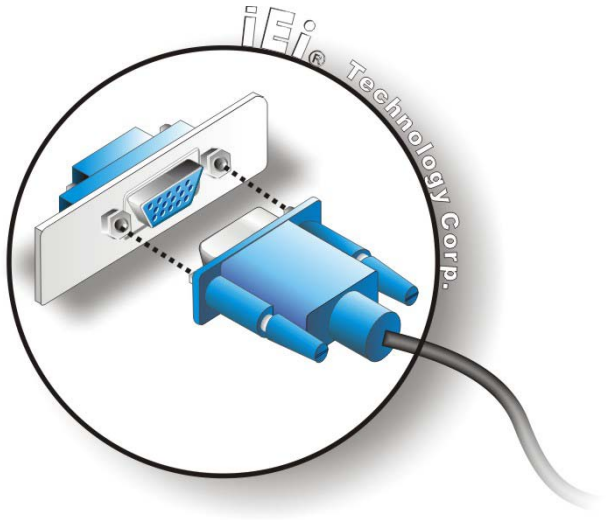


Figure 3-31: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

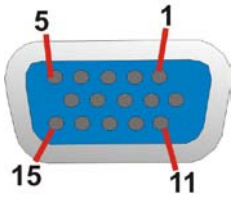


Figure 3-32: VGA Connector

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-13: VGA Connector Pinouts

3.10 Powering On/Off the System

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- **Power on** the system: press the power button for 3 seconds
- **Power off** the system: press the power button for 6 seconds

Figure 3-33: Power Button

3.11 Redundant Power

The TANK-720 is a system that supports redundant power. The redundant power input increases the reliability of the system and prevents data loss and system corruption from sudden power failure. The system can instantly and uninterruptedly switch to the second power input when the main power is unavailable or in low voltage capacity.

There are two power connectors on the rear panel. Power 1 connector is a 4-pin terminal block that supports ACC On signal. Power 2 connector is a DIN connector that can directly connect to a power adapter. The supported power input voltages are:

- **Power 1**: 9 V (+/-3%) ~ 36 V
- **Power 2**: 10.5 V (+/-3%) ~ 36 V

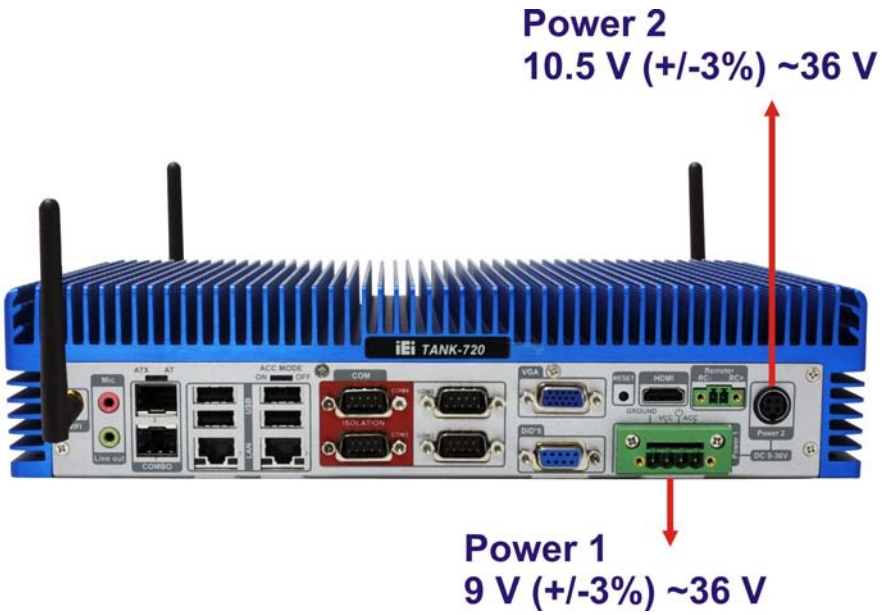


Figure 3-34: Power Connectors

When the system is in ACC On mode, the main power input is from Power 1 connector; when the system is in ACC Off mode, the main power input is from Power 2 connector. The ACC on/off mode is selected by the ACC mode switch on the rear panel (**Figure 3-12**).

The following sections describe how the redundant power works in ACC On mode and ACC Off mode.

3.11.1 ACC ON

NOTE:

In ACC On mode, the Power 1 connector must connect to ACC on signal to be able to control the system power.

The ACC On mode is designed for vehicle applications. When the TANK-720 is in ACC On mode, the main power input is Power 1 connector and the backup power is from Power 2 connector.

3.11.1.1 Boot-up

When both power connectors are connected to a power source with over 9 V, the two power LEDs on the front panel remain off until **the ACC ON signal jump from low to high**. The user can choose to use AT power mode or ATX power mode to control the system. The following flow diagrams show the boot-up process and the LED status in AT and ATX power modes.

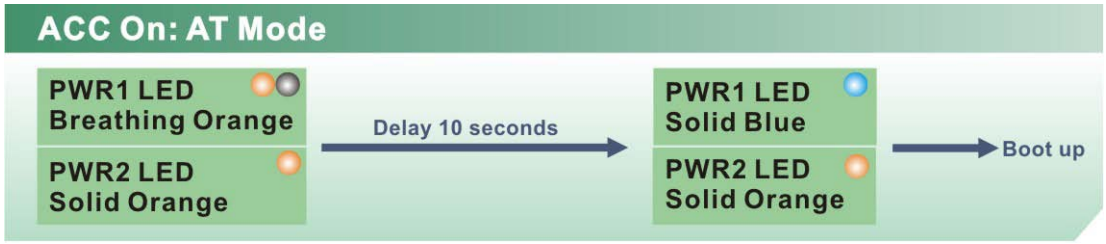


Figure 3-35: ACC On: AT Mode

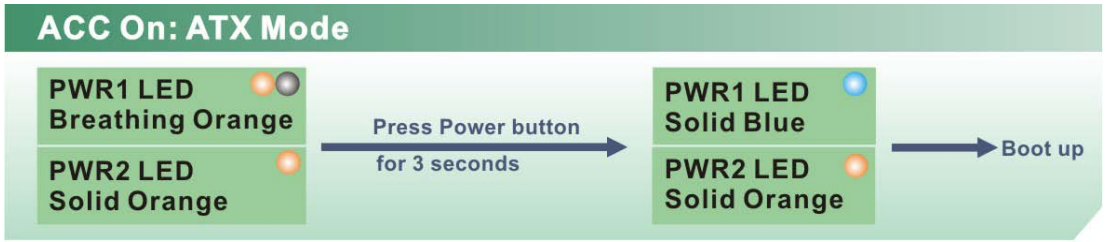


Figure 3-36: ACC On: ATX Mode

3.11.1.2 Switch to Backup Power

During the operation, the system power will switch from Power 1 to Power 2 automatically when the following situations occur:

- Power 1 < 9V and Power 2 > 10.5V
- Power 1 > 9V, but the ACC ON signal jump from high to low
- Power 1 is unplugged and Power 2 > 10.5V

The following flow diagram shows how the power is switched between Power 1 and Power 2 and their LED statuses.

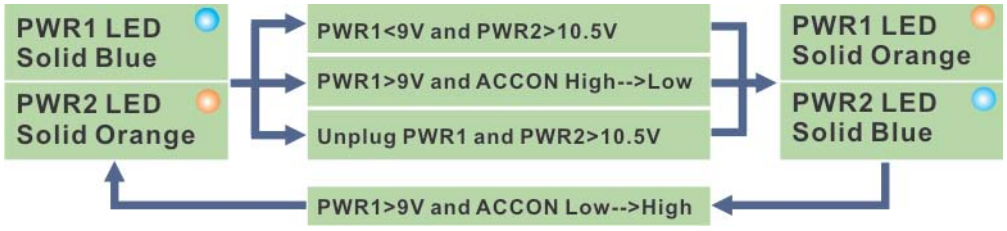


Figure 3-37: ACC On: Switch Between PWR1 and PWR2

3.11.1.3 Shutdown

The system will shutdown in the following situations:

- Power 1 < 9V and Power 2 < 10.5V
- Power 1 > 9V, Power 2 < 10.5V and ACC ON signal jump from high to low
- Press Power button for 6 seconds

The following flow diagram shows the system shutdown process and the LED statuses.

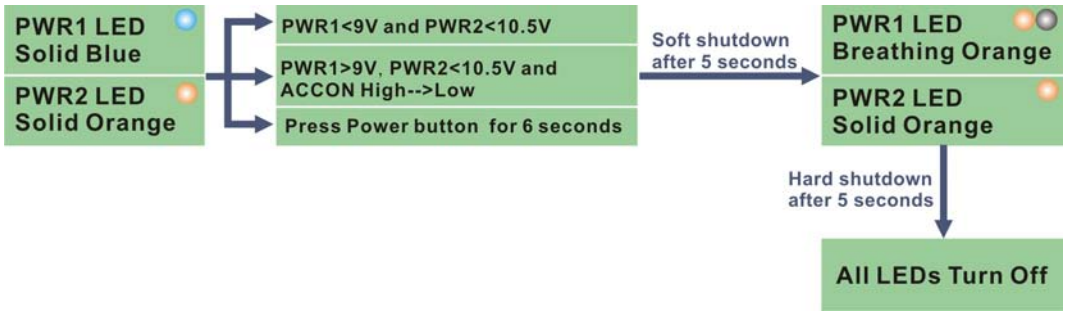


Figure 3-38: ACC On: Shutdown

NOTE:

To turn on the system in the ATX power mode, press the Power button for three seconds. Press the Power button for six seconds to turn off the system.

3.11.2 ACC OFF

When the TANK-720 is in ACC Off mode, the main power input is Power 2 connector and the backup power is from Power 1 connector.

3.11.2.1 Boot-up

When both power connectors are connected to a power source with over 9 V, the two power LEDs on the front panel turn on. The user can choose to use AT power mode or ATX power mode to control the system. The following flow diagrams show the boot-up process and the LED status in AT and ATX power modes.

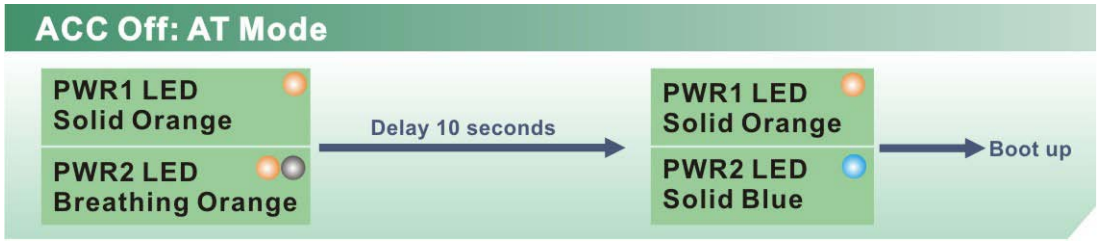


Figure 3-39: ACC Off: AT Mode

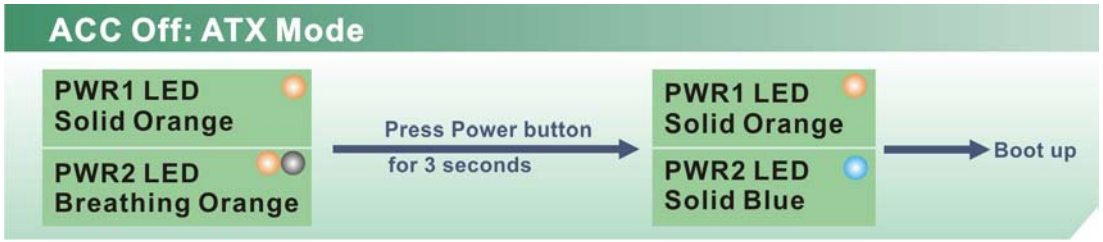


Figure 3-40: ACC Off: ATX Mode

3.11.2.2 Switch to Backup Power

During the operation, the system power will switch from Power 2 to Power 1 automatically when the following situations occur:

- Power 2 < 10.5V and Power 1 > 9V
- Power 2 is unplugged and Power 1 > 9V

The following flow diagram shows how the power is switched between Power 2 and Power 1 and their LED statuses.

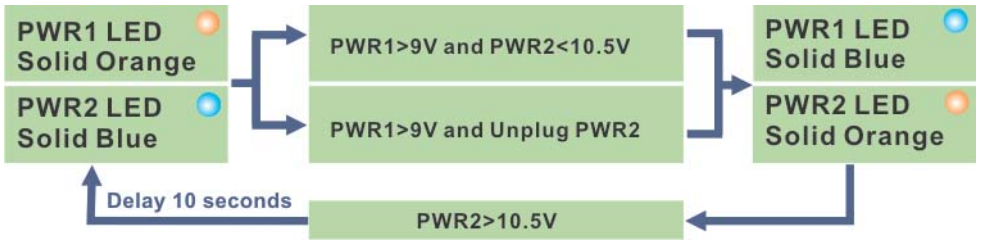


Figure 3-41: ACC Off: Switch Between PWR1 and PWR2

3.11.2.3 Shutdown

The system will shutdown in the following situations:

- Power 2 < 10.5V and Power 1 < 9V
- Press Power button for 6 seconds

The following flow diagram shows the system shutdown process and the LED statuses.

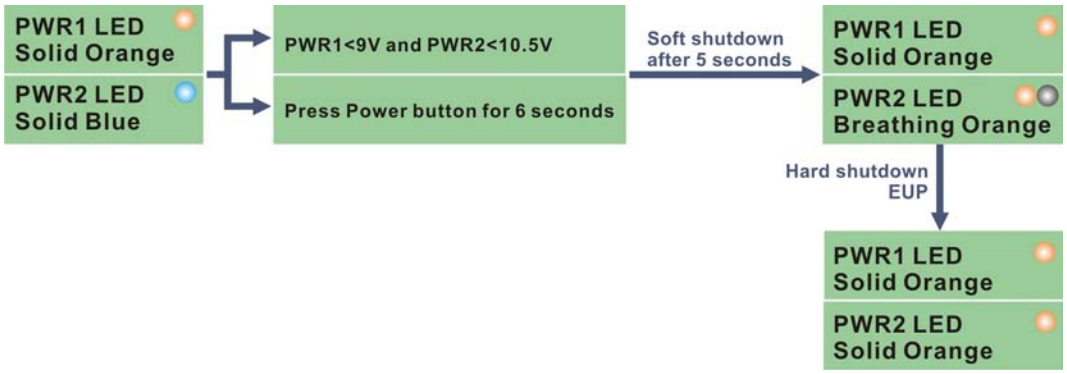


Figure 3-42: ACC Off: Shutdown

NOTE:

The power LED turns off when the power cable is unplugged from the system.

Chapter

4

BIOS

4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

4.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults.

4.1.5 BIOS Menu Bar

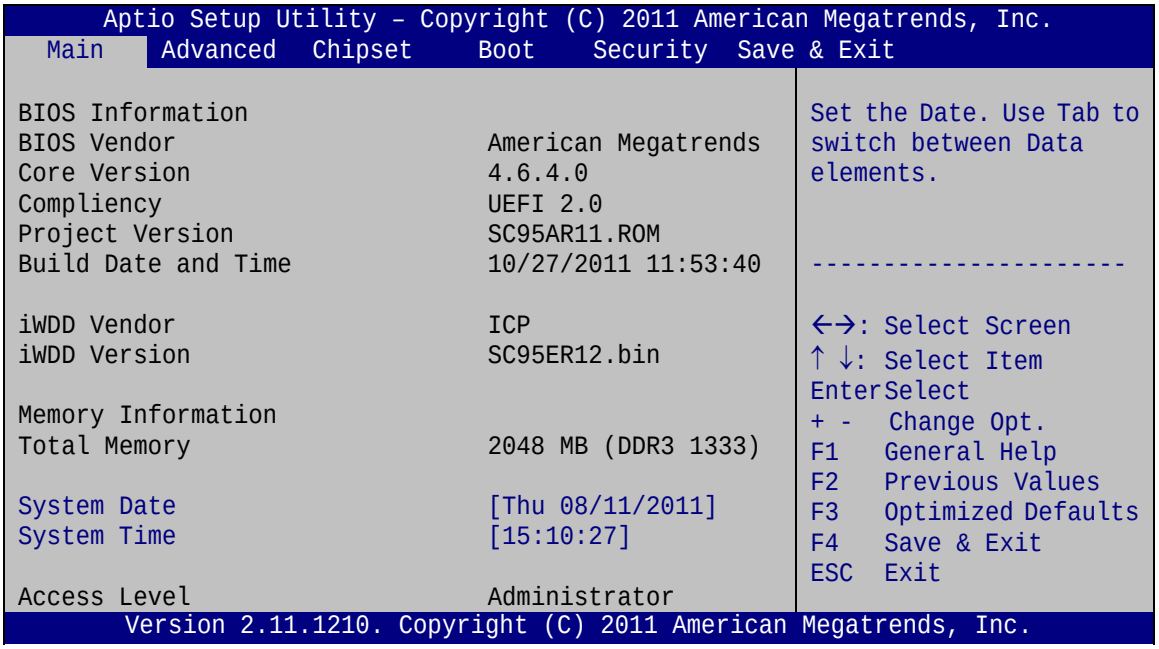
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings.

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.4.0
Compliency UEFI 2.0
Project Version SC95AR11.ROM
Build Date and Time 10/27/2011 11:53:40
iWDD Vendor ICP
iWDD Version SC95ER12.bin
Memory Information
Total Memory 2048 MB (DDR3 1333)
System Date [Thu 08/11/2011]
System Time [15:10:27]
Access Level Administrator
Set the Date. Use Tab to switch between Data elements.
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 1: Main

➔ System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliency:** Current compliant version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

The System Overview field also has two user configurable fields:

➔ iWDD Vendor

- The **iWDD Vendor** displays the installed iWDD vendor. The fields in **iWDD Vendor** cannot be changed.

➔ iWDD Version

- The **iWDD Version** displays the current iWDD version. The fields in **iWDD Version** cannot be changed.

➔ Memory Information

The **Memory Information** lists a brief summary of the on-board memory. The fields in **Memory Information** cannot be changed.

- **Total Memory:** Displays the auto-detected system memory size and type.

The System Overview field also has two user configurable fields:

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ System Time [xx:xx:xx]

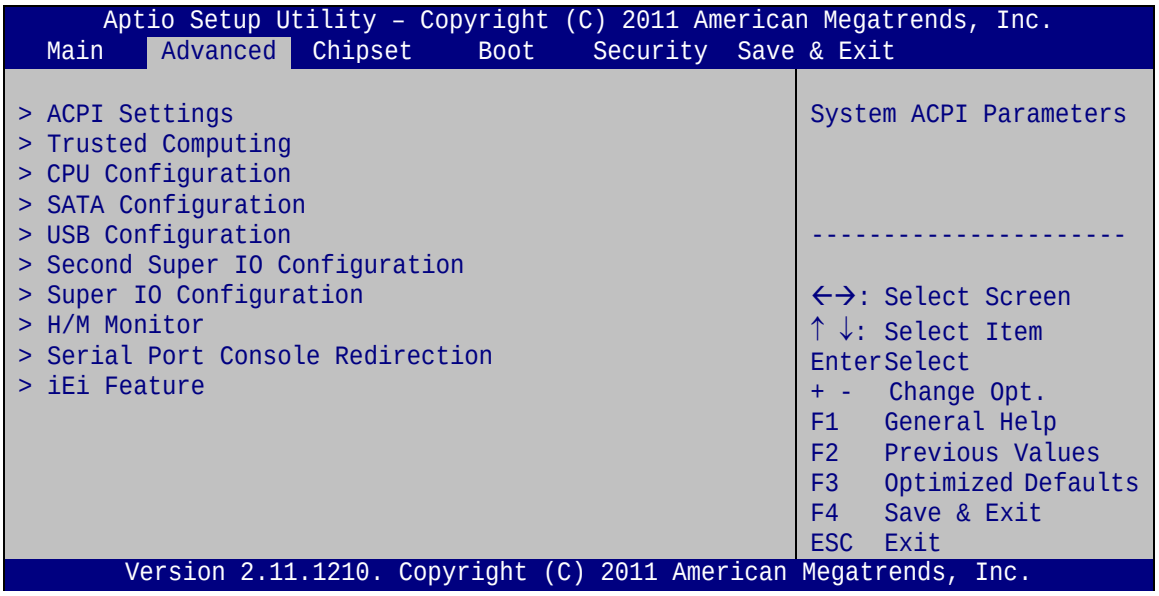
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

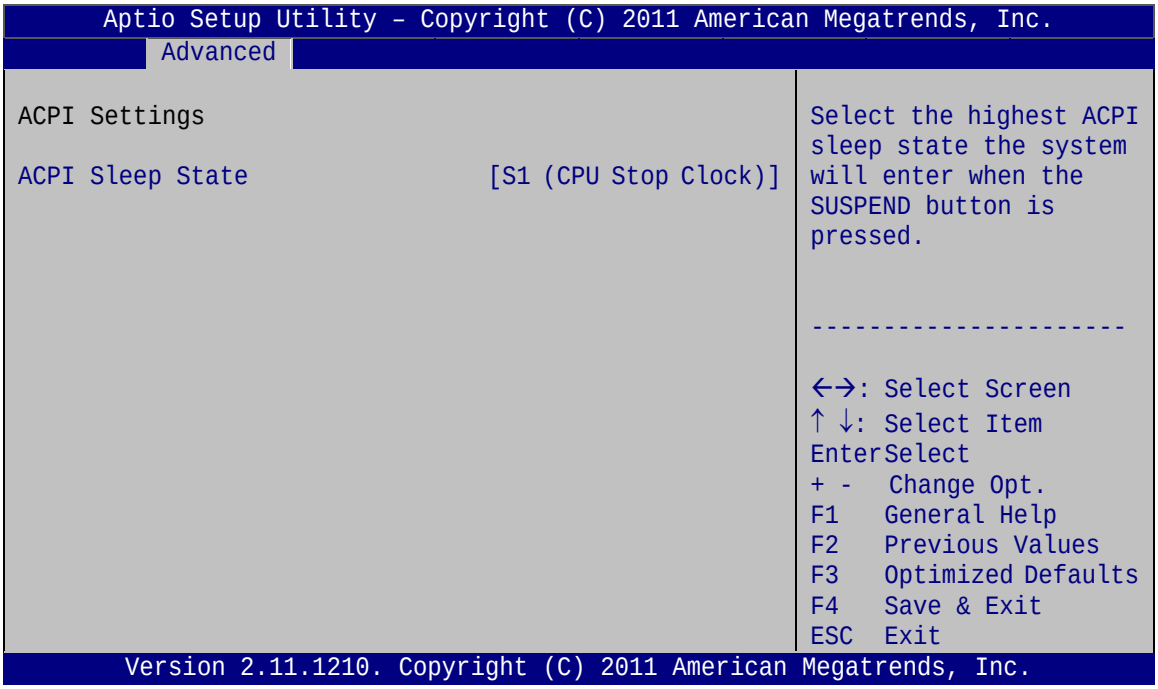
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
> ACPI Settings
> Trusted Computing
> CPU Configuration
> SATA Configuration
> USB Configuration
> Second Super IO Configuration
> Super IO Configuration
> H/M Monitor
> Serial Port Console Redirection
> iEi Feature
System ACPI Parameters
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 2: Advanced

4.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
ACPI Settings
ACPI Sleep State [S1 (CPU Stop Clock)]
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 3: ACPI Configuration

➔ ACPI Sleep State [S1 (CPU Stop Clock)]

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **Suspend Disabled**

➔ **S1 (CPU Stop Clock)** **DEFAULT** The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

4.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
TPM Configuration                          Enables or Disables TPM
  TPM SUPPORT                  [Disable]   support. O.S. will not
                                           show TPM. Reset of
Current TPM Status Information             platform is required.
  NO TPM Hardware
                                           ----------------------

                                           ←→: Select Screen
                                           ↑ ↓: Select Item
                                           EnterSelect
                                           + -   Change Opt.
                                           F1    General Help
                                           F2    Previous Values
                                           F3    Optimized Defaults
                                           F4    Save & Exit
                                           ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 4: TPM Configuration

➔ TPM Support [Disable]

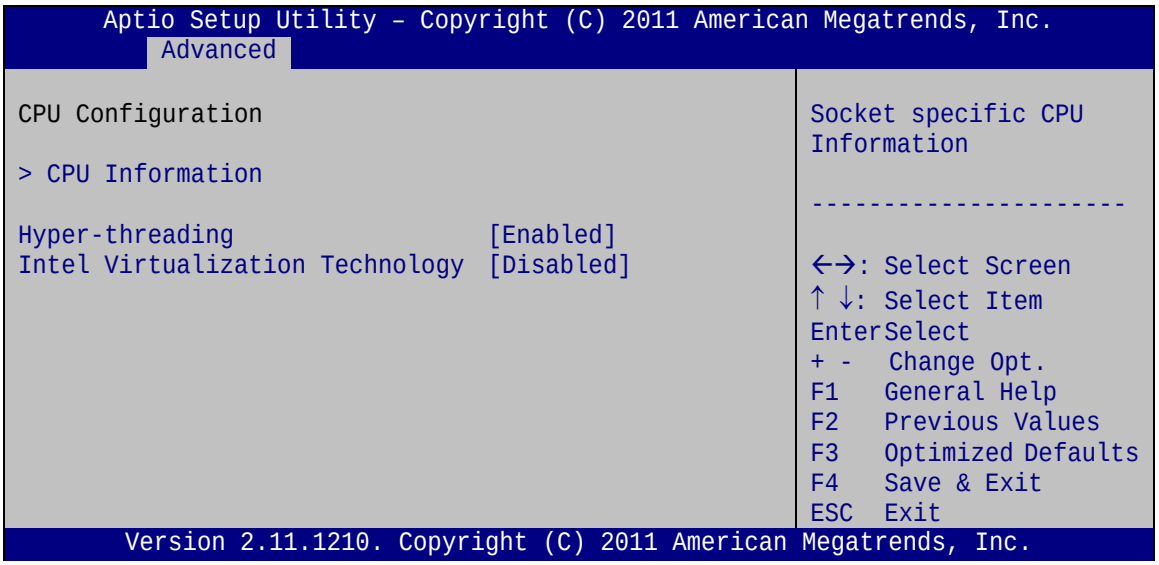
Use the **TPM Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

4.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 5: CPU Configuration

➔ Hyper-threading [Enabled]

Use the **Hyper-threading** function to enable or disable the CPU hyper threading function.

➔ **Disabled** Disables the use of hyper threading technology

➔ **Enabled** **DEFAULT** Enables the use of hyper threading technology

➔ Intel Virtualization Technology [Disabled]

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**	**DEFAULT**	Disables Intel Technology.	Virtualization
➔ **Enabled**		Enables Intel Virtualization Technology.	

4.3.3.1 CPU Information

Use the **CPU Information** submenu (**BIOS Menu 6**) to view detailed CPU specifications and configure the CPU.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
    Advanced

CPU Configuration

Intel(R) Core (TM) i3-2100T CPU @ 2.50GHz
CPU Signature                   206a7
Microcode Patch                 14
Max CPU Speed                   2500 MHz
Min CPU Speed                   1600 MHz
Processor Cores                 2
Intel HT Technology             Supported
Intel VT-x Technology           Supported
Intel SMX Technology            Not Supported

L1 Data Cache                   32 kB x 2
L1 Code Cache                   32 kB x 2
L2 Cache                        256 kB x 2
L3 Cache                        3072 kB

----------------------

←→: Select Screen
↑ ↓: Select Item
Enter Select
+/-:  Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.

- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

4.3.4 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.

```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Advanced
 SATA Configuration                                  (1) IDE Mode. (2) AHCI
                                                     Mode. (3) RAID Mode.
 SATA Mode                        [IDE Mode]
 Serial-ATA Controller 0          [Compatible]
                                                     ---------------------
 SATA Port0                       Not Present
                                                     ←→: Select Screen
 SATA Port1                       IEI Technology (15.4G ↑ ↓: Select Item
                                                     EnterSelect
                                                     + -   Change Opt.
                                                     F1    General Help
                                                     F2    Previous Values
                                                     F3    Optimized Defaults
                                                     F4    Save & Exit
                                                     ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 7: SATA Configuration

➔ SATA Mode [IDE Mode]

Use the **SATA Mode** option to configure SATA devices as normal IDE devices.

➔	**Disable**		Disables SATA devices.
➔	**IDE Mode**	**DEFAULT**	Configures SATA devices as normal IDE device.
➔	**RAID Mode**		Configures SATA devices as RAID device.

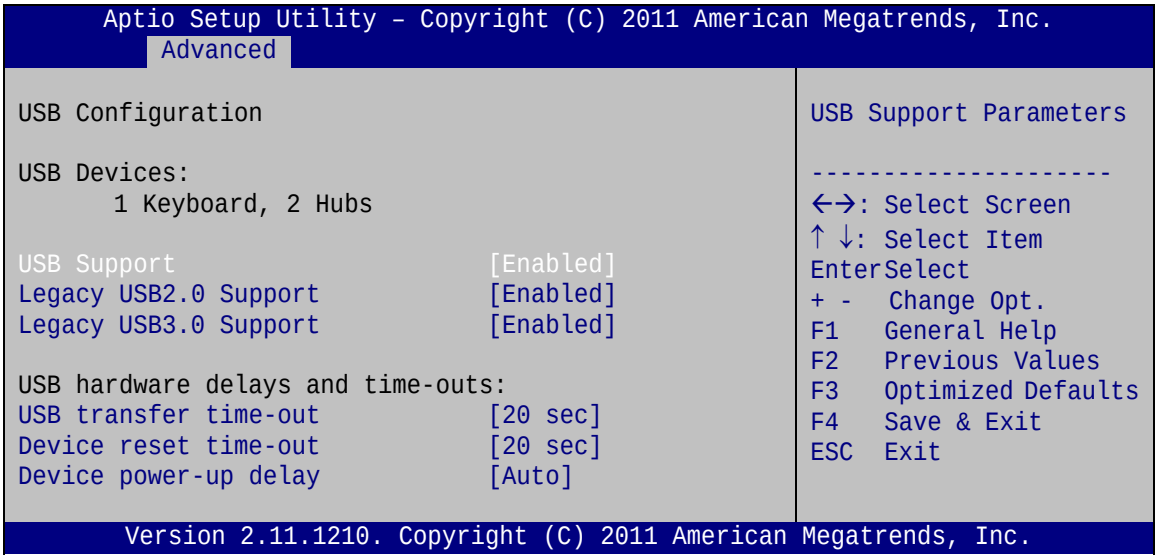
➔ Serial-ATA Controller 0 [Compatible]

Use the **Serial-ATA Controller 0** option to configure the Serial-ATA controller mode when the SATA mode is set to IDE Mode.

➔	**Disable**		Disables Serial-ATA controller.
➔	**Enhanced**		Configures the Serial-ATA controller to be in enhanced mode. In this mode, IDE channels and SATA channels are separated. Some legacy OS do not support this mode.
➔	**Compatible**	**DEFAULT**	Configures the Serial-ATA controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels.

4.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 8**) to read USB configuration information and configure the USB settings.



BIOS Menu 8: USB Configuration

➔ USB Devices

The **USB Devices** field lists the USB devices that are enabled on the system

➔ Legacy USB2.0 Support [Enabled]

Use the **Legacy USB2.0 Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Disabled**		Legacy USB support disabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

➔ Legacy USB3.0 Support [Enabled]

Use the **USB3.0 Support** option to enable or disable USB 3.0 support on the system.

➔	**Enabled**	**DEFAULT**	USB 3.0 support enabled
➔	**Disabled**		USB 3.0 support disabled

➔ USB transfer time-out [20 sec]

Use the **USB transfer time-out** option to set the USB transfer time-out.

➔	**1 sec**		Set the USB transfer time-out to 1 sec.
➔	**5 sec**		Set the USB transfer time-out to 5 sec.
➔	**10 sec**		Set the USB transfer time-out to 10 sec.
➔	**20 sec**	**DEFAULT**	Set the USB transfer time-out to 20 sec.

➔ Device reset time-out [20 sec]

Use the **Device reset time-out** option to set the device reset time-out.

➔	**10 sec**		Set the device reset time-out to 1o sec.
➔	**20 sec**	**DEFAULT**	Set the device reset time-out to 20 sec.
➔	**30 sec**		Set the device reset time-out to 30 sec.
➔	**40 sec**		Set the device reset time-out to 40 sec.

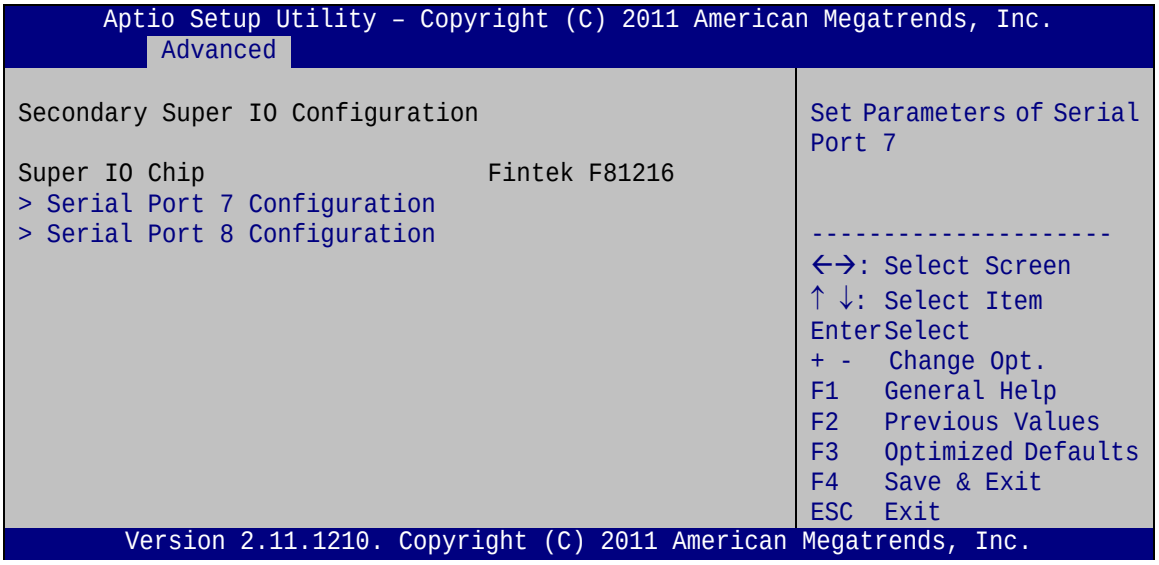
➔ Device power-up delay [Auto]

Use the **Device power-up delay** option to set the maximum time the device will take before it properly reports itself to the host controller.

➔	**Auto**	**DEFAULT**	Uses default value
➔	**Manual**		Sets the value manually

4.3.6 Secondary Super IO Configuration

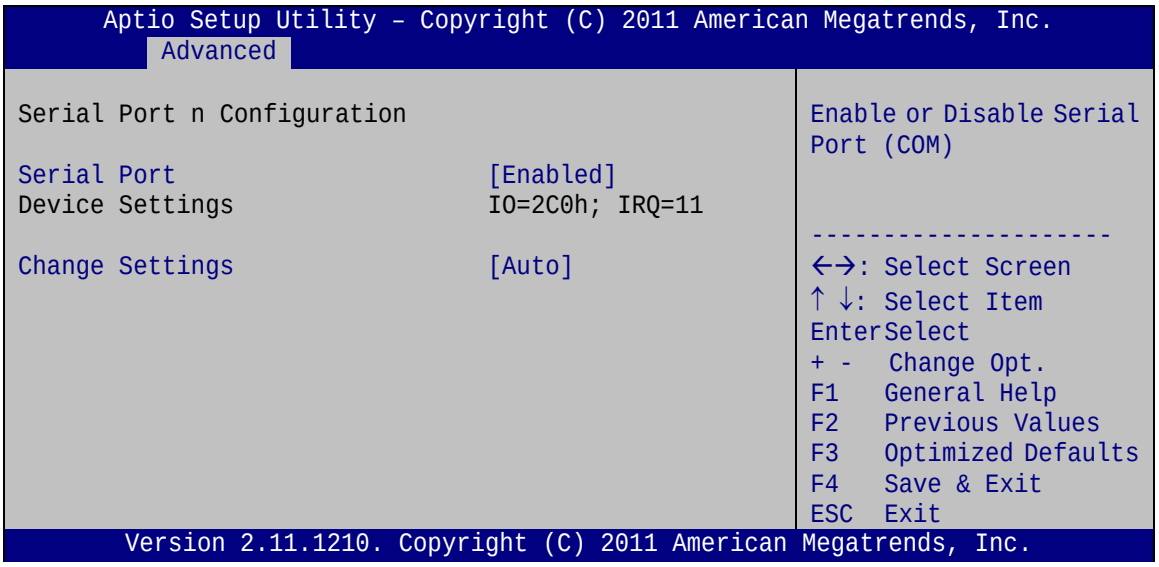
Use the **Secondary Super IO Configuration** menu (**BIOS Menu 9**) to set or change the configurations for the serial ports.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Secondary Super IO Configuration
Super IO Chip Fintek F81216
> Serial Port 7 Configuration
> Serial Port 8 Configuration
Set Parameters of Serial Port 7
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 9: F81216 Second Super IO Configuration

4.3.6.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 10**) to configure the serial port n.



BIOS Menu 10: Serial Port n Configuration Menu

4.3.6.1.1 Serial Port 7 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2C0h; IRQ=10**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10
➔ **IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
➔ **IO=2C8h; IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4
➔ **IO=2B0h; IRQ=10, 11**		Serial Port I/O port address is 2B0h and the interrupt address is IRQ10, 11
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

4.3.6.1.2 Serial Port 8 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

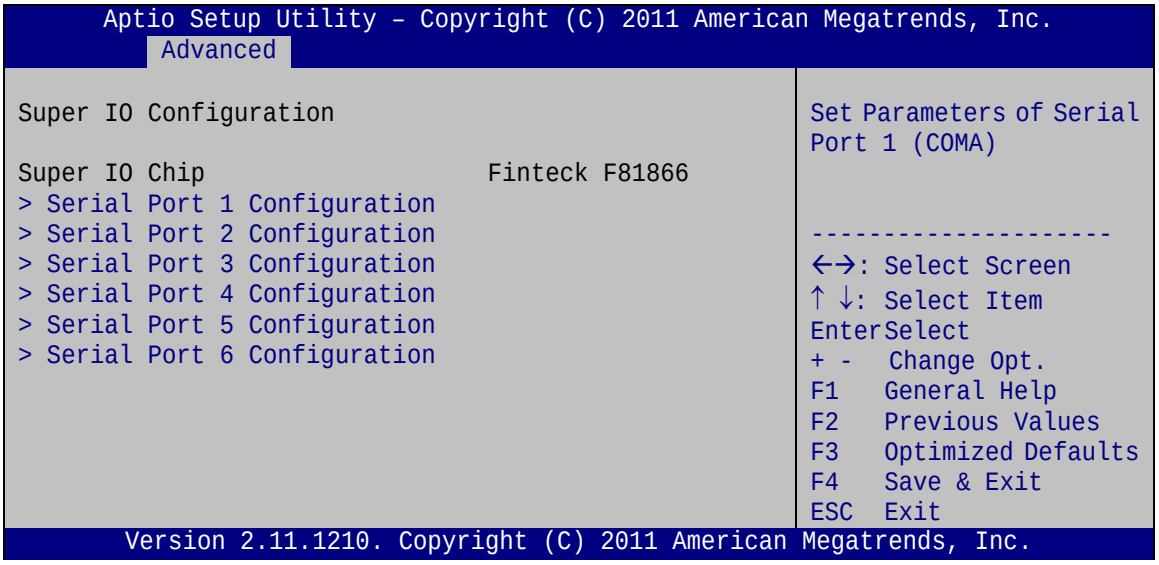
➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2C8h; IRQ=10**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10
➔ **IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
➔ **IO=2C8h; IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4
➔ **IO=2B0h; IRQ=10, 11**		Serial Port I/O port address is 2B0h and the interrupt address is IRQ10, 11
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

4.3.7 Super IO Configuration

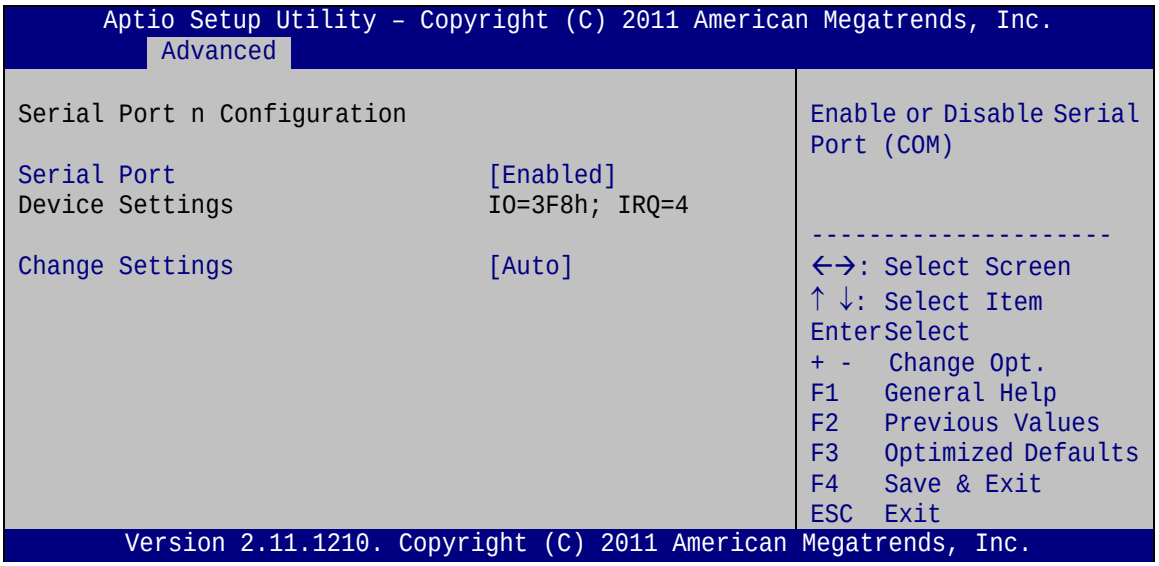
Use the **Super IO Configuration** menu (**BIOS Menu 11**) to set or change the configurations for the serial ports.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Super IO Configuration
Super IO Chip Finteck F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration
> Serial Port 4 Configuration
> Serial Port 5 Configuration
> Serial Port 6 Configuration
Set Parameters of Serial Port 1 (COMA)
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 11: Super IO Configuration

4.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 12**) to configure the serial port n.



BIOS Menu 12: Serial Port n Configuration Menu

4.3.7.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=3F8h; IRQ=4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
➔ **IO=2C8h; IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

4.3.7.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.

➔ **IO=2F8h; IRQ=3** Serial Port I/O port address is 2F8h and the interrupt address is IRQ3

➔ **IO=3F8h; IRQ=3, 4** Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4

➔ **IO=2F8h; IRQ=3, 4** Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4

➔ **IO=2C0h; IRQ=3, 4** Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4

➔ **IO=2C8h; IRQ=3, 4** Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

4.3.7.1.3 Serial Port 3 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=3E8h; IRQ=10** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- ➔ **IO=3E8h; IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2E8h; IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2D0h; IRQ=10, 11** Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- ➔ **IO=2D8h; IRQ=10, 11** Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

4.3.7.1.4 Serial Port 4 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** Disable the serial port
- ➔ **Enabled** **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2E8h; IRQ=10** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
- ➔ **IO=3E8h; IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11

➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

4.3.7.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2C0h; IRQ=10**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10
➔ **IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

- **IO=2E0h; IRQ=10, 11** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

➔ Device Mode [RS422/485]

Use the **Device Mode** option to set the serial port to normal or RS-422/485 communications..

- **Normal** — Sets the serial port mode to normal.
- **RS422/485** **DEFAULT** — Enables serial port RS-422/485 support.

4.3.7.1.6 Serial Port 6 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** — Disable the serial port
- **Enabled** **DEFAULT** — Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- **IO=2E0h; IRQ=10** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10
- **IO=2C0h; IRQ=10, 11** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
- **IO=2C8h; IRQ=10, 11** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11

➔ **IO=2D0h; IRQ=10, 11**	Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h; IRQ=10, 11**	Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
➔ **IO=2E0h; IRQ=10, 11**	Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

➔ Device Mode [RS422/485]

Use the **Device Mode** option to set the serial port to normal or RS-422/485 communications..

➔ **Normal**		Sets the serial port mode to normal.
➔ **RS422/485**	**DEFAULT**	Enables serial port RS-422/485 support.

4.3.8 H/W Monitor

The **H/W Monitor** menu (**BIOS Menu 13**) shows the operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced

PC Health Status

CPU Temperature                 :+72 C
System Temperature              :+40 C
V3.3S                           :+3.312 V
CPU_CORE                        :+0.984 V
+V5S                            :+4.880 V
+12VS                           :+12.056 V
+1.5V_DDR3                      :+1.624 V
VSB3V                           :+3.360 V
VBAT                            :+3.296 V
5VSB                            :+5.160 V

                                ---------------------
                                ←→: Select Screen
                                ↑ ↓: Select Item
                                EnterSelect
                                + -   Change Opt.
                                F1    General Help
                                F2    Previous Values
                                F3    Optimized Defaults
                                F4    Save & Exit
                                ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 13: H/W Monitor

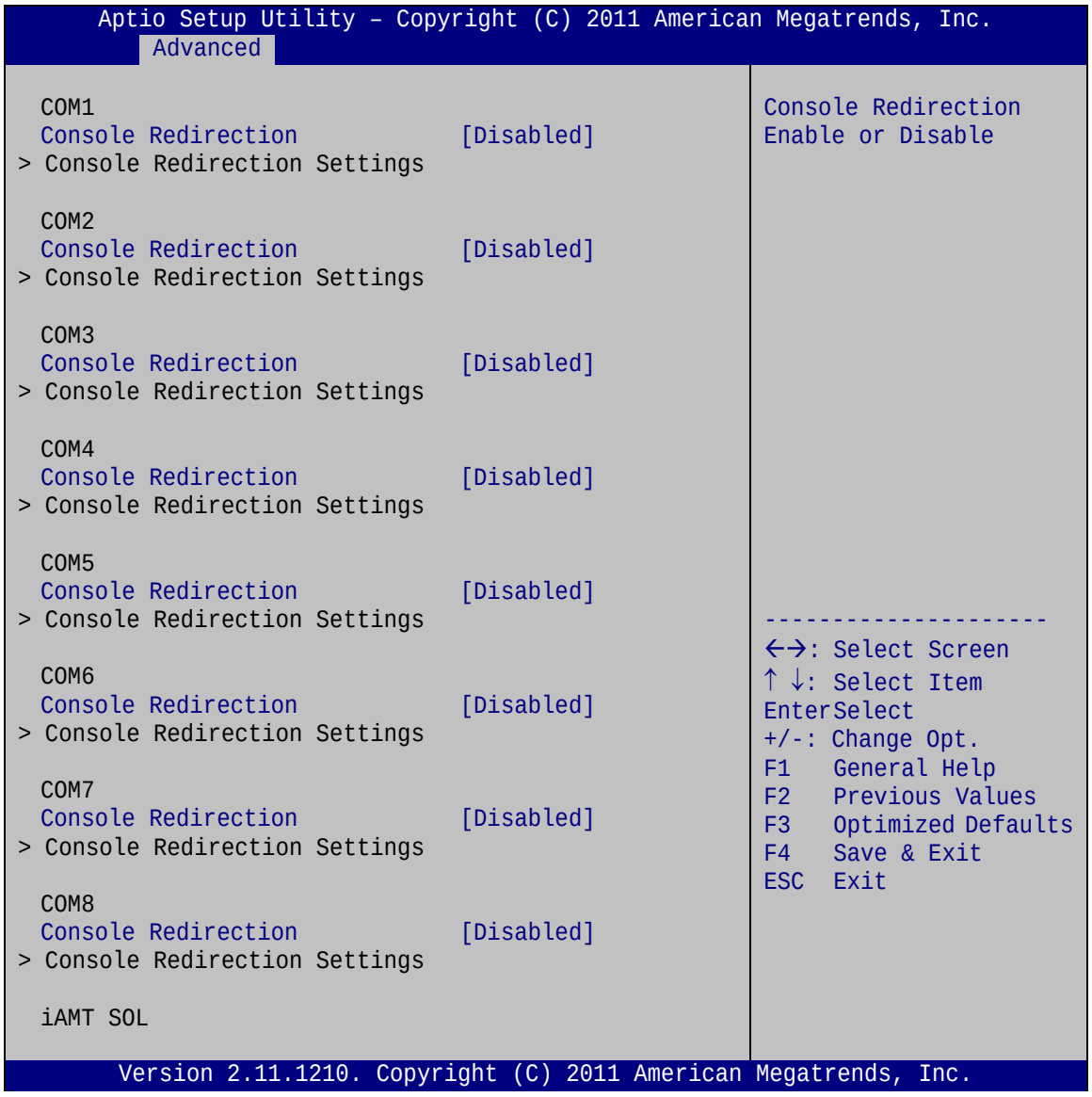
➔ PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Voltages:
  - V3.3S
  - CPU_CORE
  - +V5S
  - +V12S
  - +1.5V_DDR3
  - VSB3V
  - VBAT
  - 5VSB

4.3.9 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 14**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 14: Serial Port Console Redirection

➔ Console Redirection [Disabled]

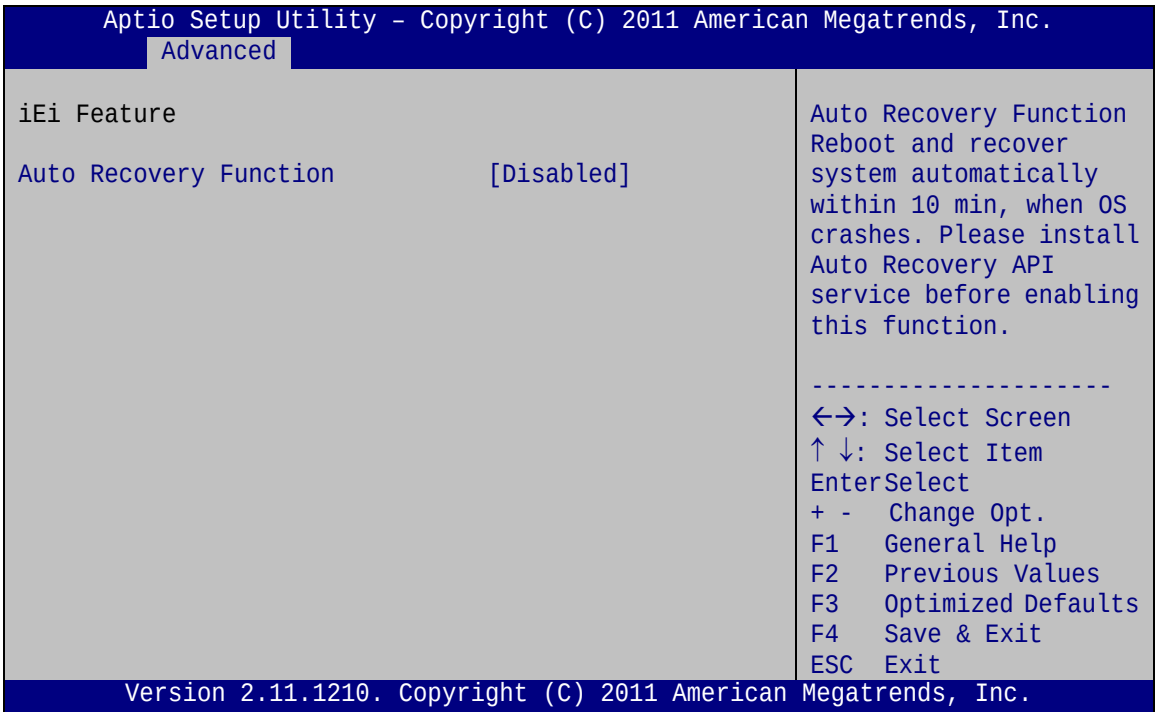
Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled** **DEFAULT** Disabled the console redirection function

➔ **Enabled** Enabled the console redirection function

4.3.10 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 15**) to configure the iEi features.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
iEi Feature
Auto Recovery Function [Disabled]
Auto Recovery Function
Reboot and recover system automatically within 10 min, when OS crashes. Please install Auto Recovery API service before enabling this function.
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 15: iEi Feature

➔ Auto Recovery Function [Disabled]

Use **Auto Recovery Function** option to enable or disable the auto recovery function.

➔ **Disabled** **DEFAULT** Disabled the auto recovery function

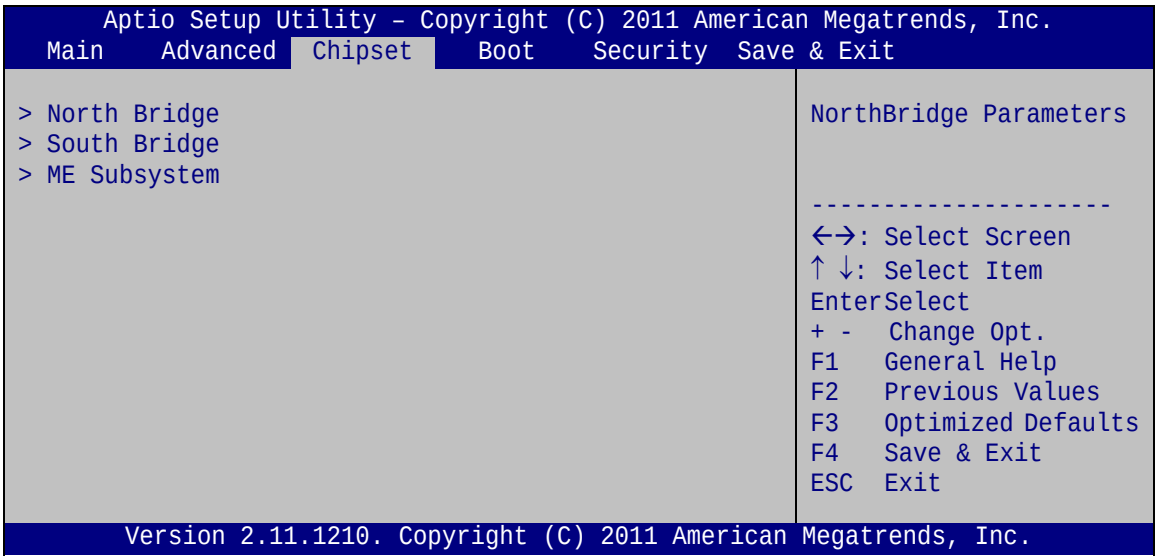
➔ **Enabled** Enabled the auto recovery function

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 16**) to access the Northbridge and Southbridge configuration menus.

WARNING!

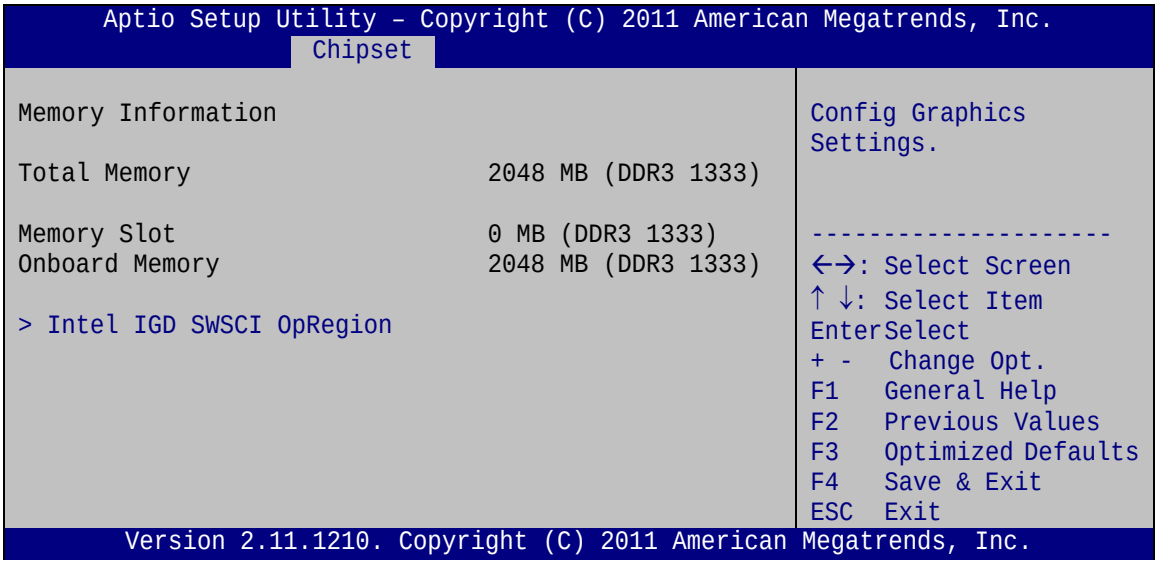
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
> North Bridge
> South Bridge
> ME Subsystem
NorthBridge Parameters
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 16: Chipset

4.4.1 North Bridge

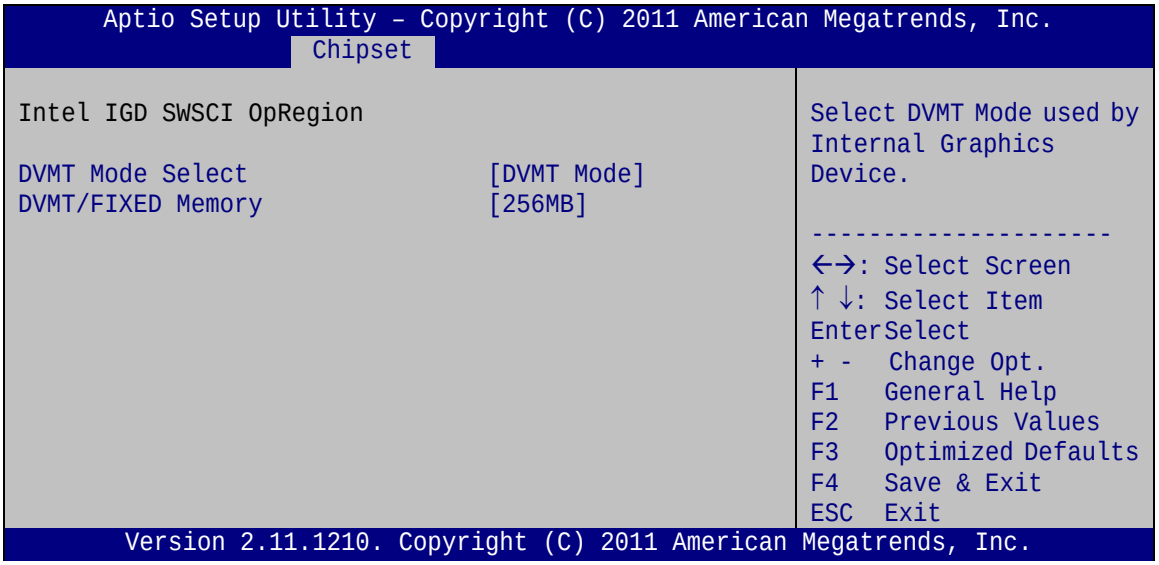
Use the **North Bridge** menu (**BIOS Menu 17**) to configure the Northbridge chipset.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Memory Information
Total Memory 2048 MB (DDR3 1333)
Memory Slot 0 MB (DDR3 1333)
Onboard Memory 2048 MB (DDR3 1333)
> Intel IGD SWSCI OpRegion
Config Graphics Settings.
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 17: Northbridge Chipset Configuration

4.4.1.1 Intel IGD SWSCI OpRegion

Use the **Intel IGD SWSCI OpRegion** menu (**BIOS Menu 18**) to configure the graphics options.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Intel IGD SWSCI OpRegion
DVMT Mode Select [DVMT Mode]
DVMT/FIXED Memory [256MB]
Select DVMT Mode used by Internal Graphics Device.
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 18: Graphics Configuration

➔ DVMT Mode Select [DVMT Mode]

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔	**Fixed Mode**		A fixed portion of graphics memory is reserved as graphics memory.
➔	**DVMT Mode**	**DEFAULT**	Graphics memory is dynamically allocated according to the system and graphics needs.

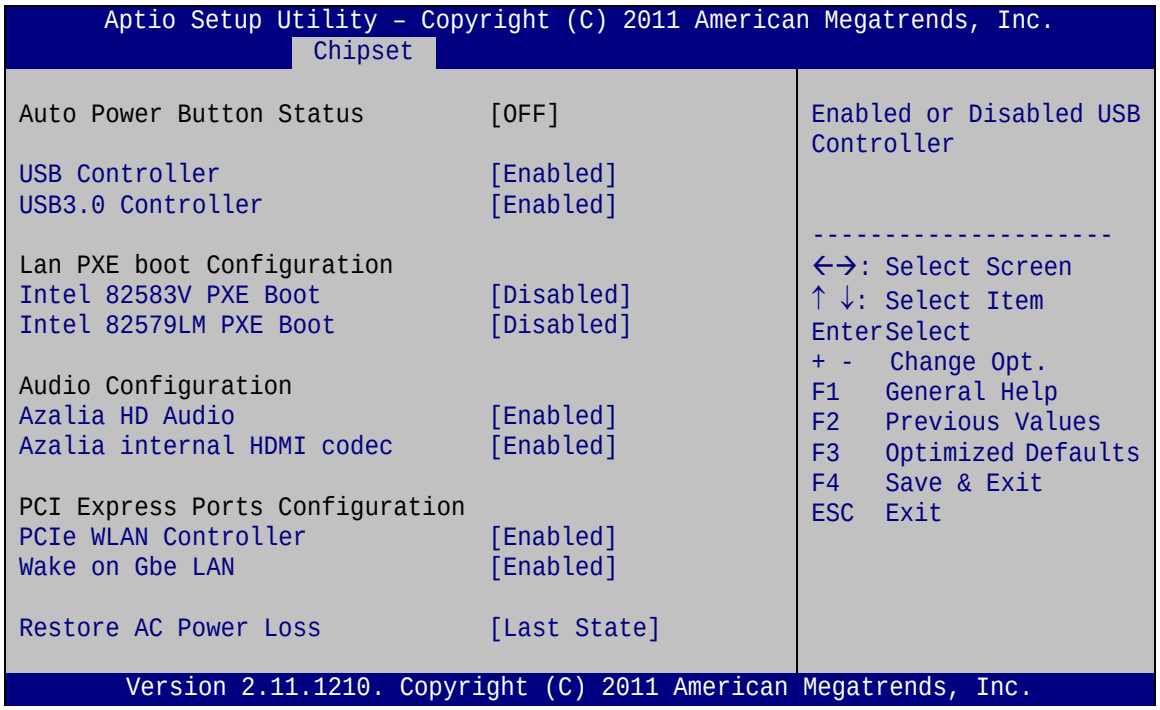
➔ DVMT Memory [256MB]

Use the **DVMT Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB
- 256 MB **DEFAULT**
- Maximum

4.4.2 South Bridge

Use the **South Bridge** menu (**BIOS Menu 19**) to configure the Southbridge chipset.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Auto Power Button Status [OFF]
USB Controller [Enabled]
USB3.0 Controller [Enabled]
Lan PXE boot Configuration
Intel 82583V PXE Boot [Disabled]
Intel 82579LM PXE Boot [Disabled]
Audio Configuration
Azalia HD Audio [Enabled]
Azalia internal HDMI codec [Enabled]
PCI Express Ports Configuration
PCIe WLAN Controller [Enabled]
Wake on Gbe LAN [Enabled]
Restore AC Power Loss [Last State]
Enabled or Disabled USB Controller
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 19: Southbridge Chipset Configuration

➔ USB Controller [Enabled]

Use the **USB Controller** BIOS option to enable or disable USB controller.

➔ **Disabled**		USB controller disabled
➔ **Enabled**	**DEFAULT**	USB controller enabled

➔ USB 3.0 Controller [Enabled]

Use the **USB 3.0 Controller** BIOS option to enable or disable USB 3.0 controller.

➔ **Enabled**	**DEFAULT**	USB 3.0 controller enabled
➔ **Disabled**		USB 3.0 controller disabled

➔ Intel 82583V PXE Boot [Disabled]

Use the **Intel 82583V PXE Boot** option to enable or disable the boot option for the Intel 82583V PXE.

➔ **Disabled** **DEFAULT** Disables Intel 82583V PXE Boot option

➔ **Enabled** Enables Intel 82583V PXE Boot option

➔ Intel 82579LM PXE Boot [Disabled]

Use the **Intel 82579LM PXE Boot** option to enable or disable the boot option for the Intel 82579LM PXE.

➔ **Disabled** **DEFAULT** Disables Intel 82579LM PXE Boot option

➔ **Enabled** Enables Intel 82579LM PXE Boot option

➔ Azalia HD Audio [Enabled]

Use the **Azalia HD Audio** option to enable or disable the High Definition Audio controller.

➔ **Disabled** The onboard High Definition Audio controller is disabled

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller is detected automatically and enabled

➔ Azalia Internal HDMI Codec [Enabled]

Use the **Azalia Internal HDMI Codec** option to enable or disable the internal HDMI codec for High Definition Audio.

➔ **Disabled** Disables the internal HDMI codec for High Definition Audio

➔ **Enabled** **DEFAULT** Enables the internal HDMI codec for High Definition Audio

➔ PCIe WLAN Controller [Enabled]

Use the **PCIe WLAN Controller** option to enable or disable the PCI Express WLAN controller.

➔ **Disabled** Disables the PCI Express WLAN controller

➔ **Enabled** **DEFAULT** Enables the PCI Express WLAN controller

➔ Wake on Gbe LAN [Enabled]

Use the **Wake on Gbe LAN** option to enable or disable wake on Gbe LAN.

➔ **Disabled** Disables wake on Gbe LAN

➔ **Enabled** **DEFAULT** Enables wake on Gbe LAN

➔ Restore AC Power Loss [Last State]

Use the **Restore AC Power Loss** option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off

➔ **Power On** The system turns on

➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

4.4.3 ME Configuration

Use the **ME Configuration** menu (**BIOS Menu 20**) to configure the Intel® Management Engine (ME) configuration options.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                    Chipset
Intel ME Subsystem Configuration          | MEBx Mode Help
ME Version                    7.0.10.1203 |
MEBx Mode                     [Normal]    | ---------------------
Unconfigure AMT/ME            [Disabled]  | ←→: Select Screen
                                          | ↑ ↓: Select Item
                                          | Enter Select
                                          | + -   Change Opt.
                                          | F1    General Help
                                          | F2    Previous Values
                                          | F3    Optimized Defaults
                                          | F4    Save & Exit
                                          | ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 20: ME Configuration

➔ MEBx Mode [Normal]

Use the **MEBx Mode** option to configure MEBx Mode options.

➔	**Normal**	**DEFAULT**	Enables normal mode
➔	**Hidden Ctrl + P**		Enables hidden Ctrl+P function
➔	**Enter MEBx Setup**		Enables user to enter MEBx setup

➔ Unconfigure AMT/ME [Disabled]

Use the **Unconfigure AMT/ME** option to perform AMT/ME unconfigure without password operation.

➔	**Disabled**	**DEFAULT**	Not perform AMT/ME unconfigure
➔	**Enabled**		To perform AMT/ME unconfigure

4.5 Boot

Use the **Boot** menu (**BIOS Menu 21**) to configure system boot options.

```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced   Chipset    Boot    Security   Save & Exit

Boot Configuration                          Select the keyboard
Bootup NumLock State            [On]        NumLock state

CSM16 Module Version            07.65

                                            ---------------------
GateA20 Active                  [Upon Request]  ←→: Select Screen
Option ROM Messages             [Force BIOS]    ↑ ↓: Select Item
Interrupt 19 Capture            [Disabled]      EnterSelect
                                            + -   Change Opt.
Boot Option Priorities                      F1    General Help
Boot Option #1                  [SATA SM: IEI Tech…]  F2    Previous Values
                                            F3    Optimized Defaults
Hard Drive BBS Priorities                   F4    Save & Exit
                                            ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 21: Boot

➔ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.
➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ GateA20 Active [Upon Request]

Use the **GateA20 Active** option to set the GateA20 active mode.

➔ **Upon Request**	**DEFAULT**	GateA20 can be disabled using BIOS services.
➔ **Always**		Do not allow disabling GateA20.

➔ Option ROM Messages [Force BIOS]

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS**	**DEFAULT**	Sets display mode to force BIOS.
➔ **Keep Current**		Sets display mode to current.

➔ Interrupt 19 Capture [Disabled]

Use the **Interrupt 19 Capture** option to s enable or disable interrupt 19 capture.

➔ **Force BIOS**	**DEFAULT**	Enables interrupt 19 capture.
➔ **Keep Current**		Disables interrupt 19 capture.

➔ Boot Option #1 [SATA SM: IEI Tech…]

Use **Boot Option #1** to enable or disable booting from the detected drive.

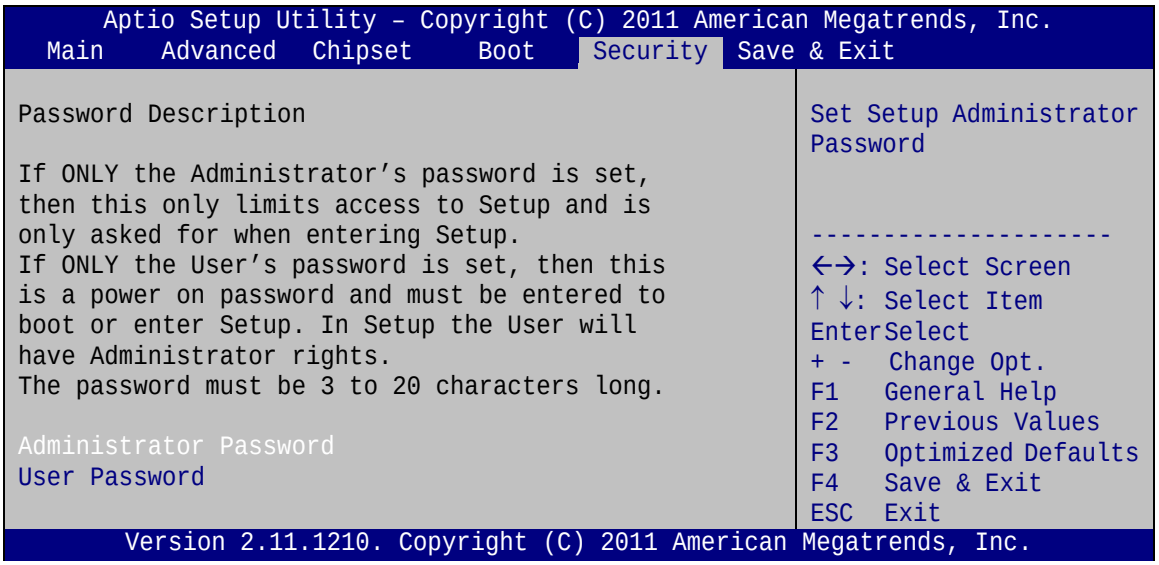
➔ **SATA SM: IEI Tech…**	**DEFAULT**	Enables booting from the detected storage device.
➔ **Disabled**		Disables boot option.

➔ Hard Drive BBS Priorities

Use **Hard Drive BBS Priorities** option to set the system boot order.

4.6 Security

Use the **Security** menu (**BIOS Menu 22**) to set system and user passwords.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password must be 3 to 20 characters long.
Administrator Password
User Password
Set Setup Administrator Password
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 22: Security

➔ Administrator Password

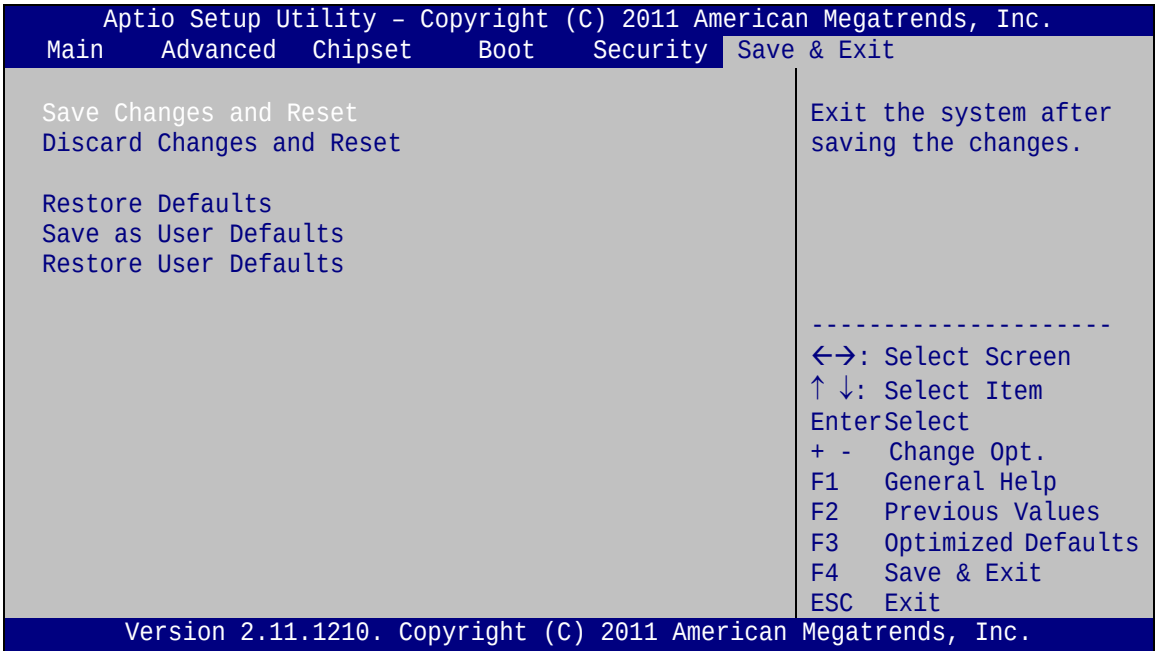
Use the **Administrator Password** to set or change a administrator password.

➔ User Password

Use the **User Password** to set or change a user password.

4.7 Exit

Use the **Exit** menu (**BIOS Menu 23**) to load default BIOS values, optimal failsafe values and to save configuration changes.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Reset
Discard Changes and Reset
Restore Defaults
Save as User Defaults
Restore User Defaults
Exit the system after saving the changes.
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 23:Exit

➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Appendix

A

One Key Recovery

A.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. This tool provides quick and easy shortcuts for creating a backup and reverting to that backup or reverting to the factory default settings.

NOTE:

The latest One Key Recovery software provides an auto recovery function that allows a system running Microsoft Windows OS to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. Please refer to Section A.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.

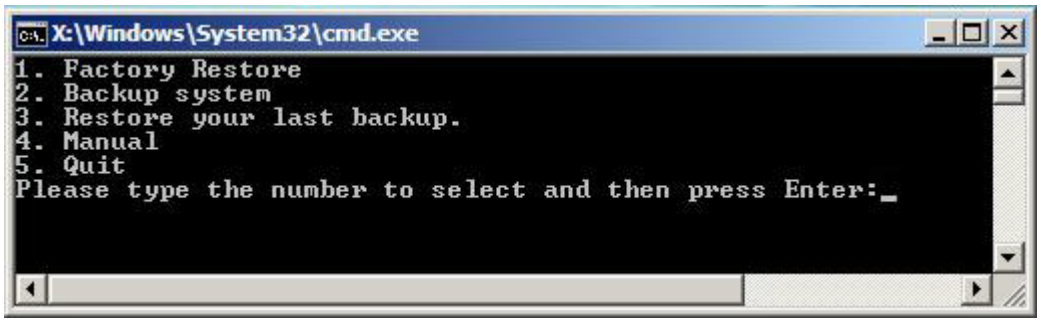


Figure A-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure A-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see **Section A.2.1**)
2. Create partitions (see **Section A.2.2**)
3. Install operating system, drivers and system applications (see **Section A.2.3**)
4. Build the recovery partition (see **Section A.2.4**)
5. Create factory default image (see **Section A.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The detailed information of each function is described in **Section A.5**.

NOTE:

The initial setup procedures for Linux system are described in **Section A.3**.

A.1.1 System Requirement

NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the

partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%

NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

A.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating system (OS). The supported OS versions are listed below.

- Microsoft Windows
  - Windows XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)

- Ubuntu 8.10 (Intrepid)
- Ubuntu 7.10 (Gutsy)
- Ubuntu 6.10 (Edgy)
- Debian 5.0 (Lenny)
- Debian 4.0 (Etch)
- SuSe 11.2
- SuSe 10.3

NOTE:

Installing unsupported OS versions may cause the recovery tool to fail.

A.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore Windows system, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section A.2.1**)

Step 2: Create partitions (see **Section A.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section A.2.3**)

Step 4: Build the recovery partition (see **Section A.2.4**) or build the auto recovery partition (see **Section A.3**)

Step 5: Create factory default image (see **Section A.2.5**)

The detailed descriptions are described in the following sections.

NOTE:

The setup procedures described below are for Microsoft Windows operating system users. For Linux, most of the setup procedures are the same except for several steps described in **Section A.3**.

A.2.1 Hardware and BIOS Setup

Step 1: Make sure the system is powered off and unplugged.

Step 2: Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.

Step 3: Connect an optical disk drive to the system and insert the recovery CD.

Step 4: Turn on the system.

Step 5: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 6: Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).

Step 7: Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

A.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

Step 1: Put the recovery CD in the optical drive of the system.

Step 2: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

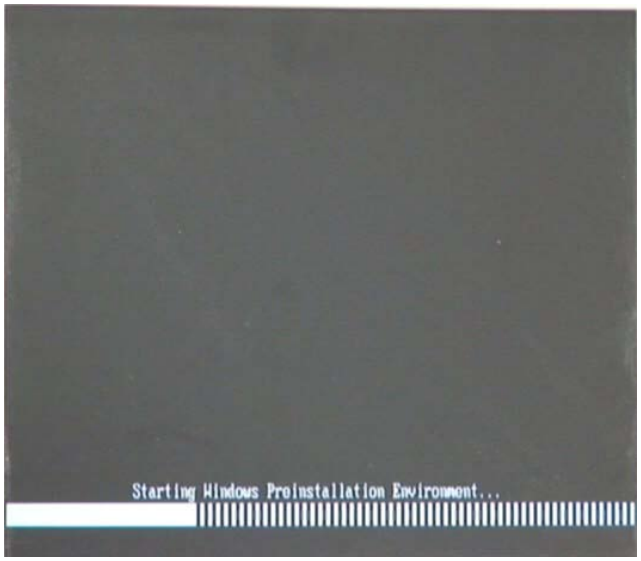


Figure A-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

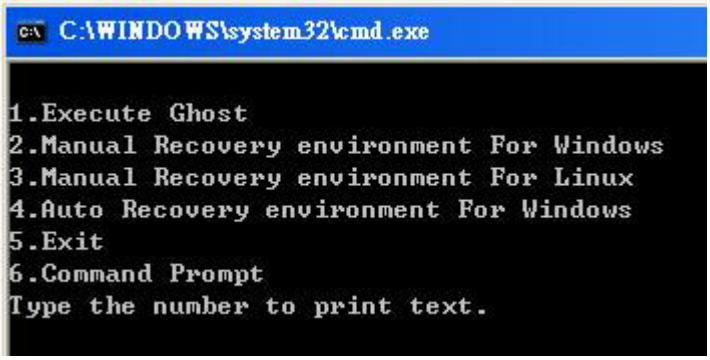


Figure A-3: Recovery Tool Setup Menu

Step 4: Press <**6**> then <Enter>.

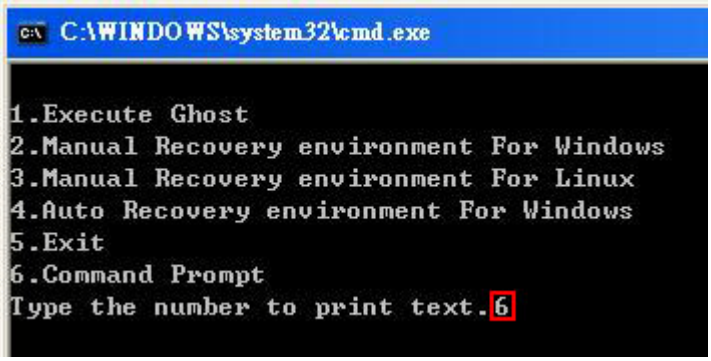


Figure A-4: Command Mode

Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

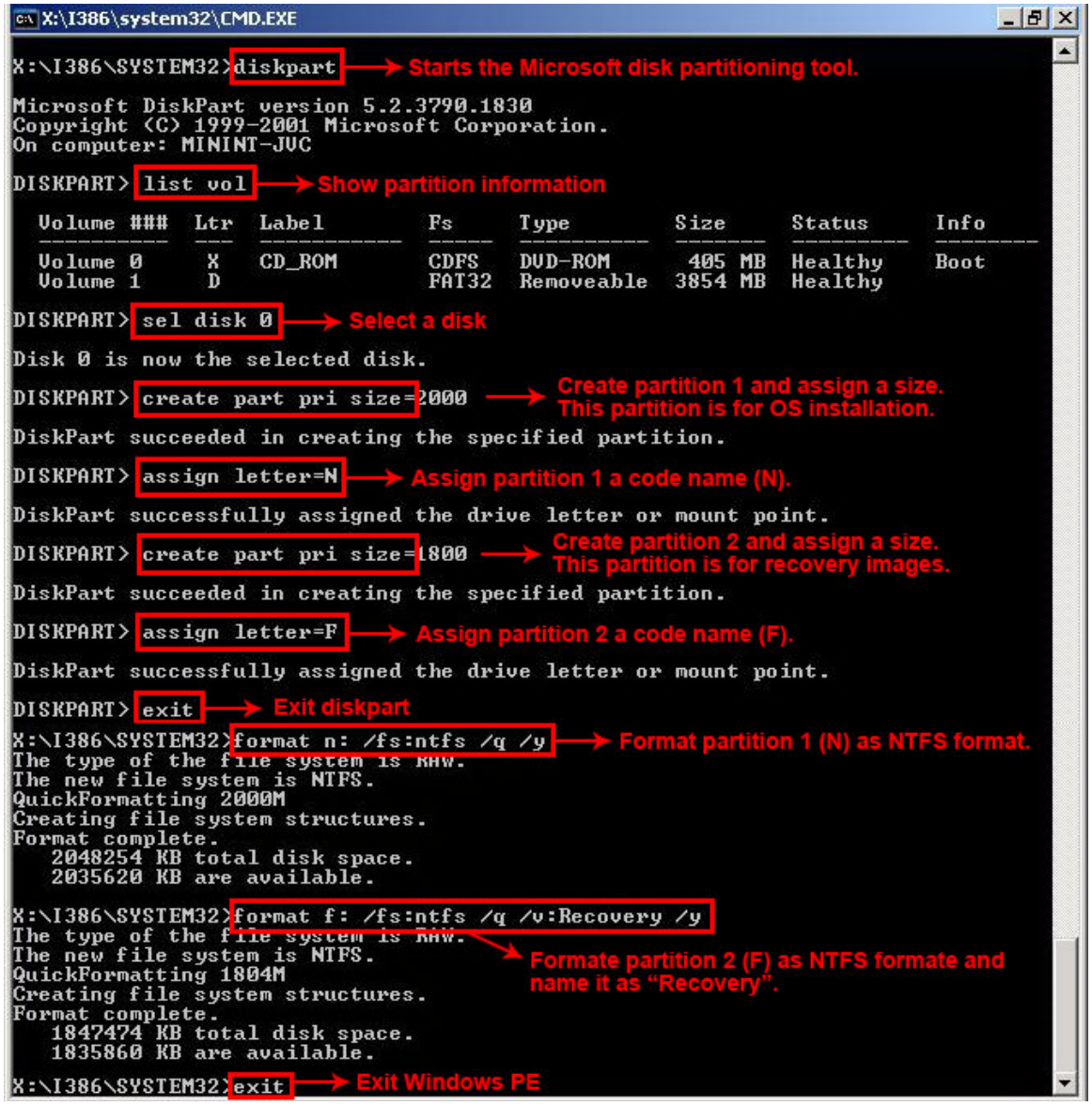
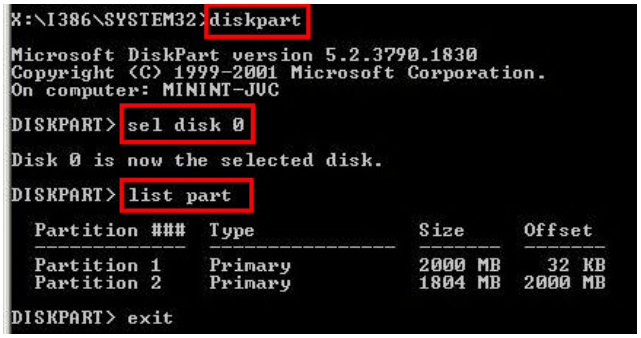

X:\I386\system32\CMD.EXE
X:\I386\SYSTEM32>diskpart
Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> list vol
Show partition information
Volume ### Ltr Label Fs Type Size Status Info
Volume 0 X CD_ROM CDFS DVD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy
DISKPART> sel disk 0
Select a disk
Disk 0 is now the selected disk.
DISKPART> create part pri size=2000
Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=N
Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> create part pri size=1800
Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=F
Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> exit
Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y
Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.
X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.
Formate partition 2 (F) as NTFS formate and
name it as “Recovery”.
X:\I386\SYSTEM32>exit
Exit Windows PE

Figure A-5: Partition Creation Commands

NOTE:

Use the following commands to check if the partitions were created successfully.


X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
Partition ### Type Size Offset
Partition 1 Primary 2000 MB 32 KB
Partition 2 Primary 1804 MB 2000 MB
DISKPART> exit

Step 6: Press any key to exit the recovery tool and automatically reboot the system.

Please continue to the following procedure: Build-up Recovery Partition.

A.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

A.2.4 Build-up Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

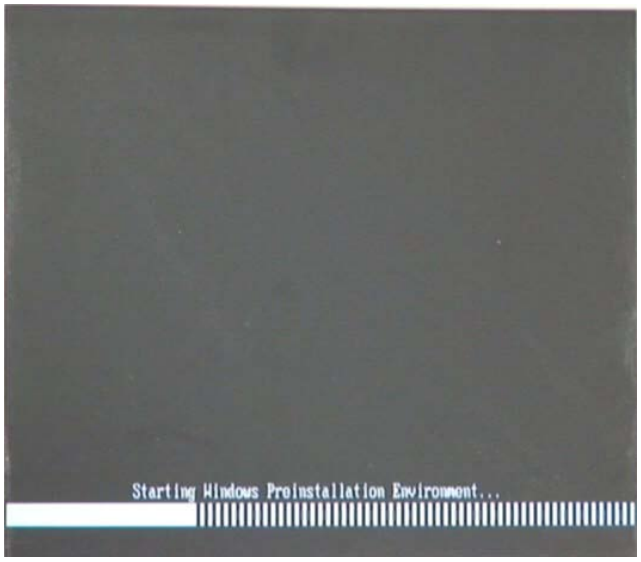


Figure A-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.

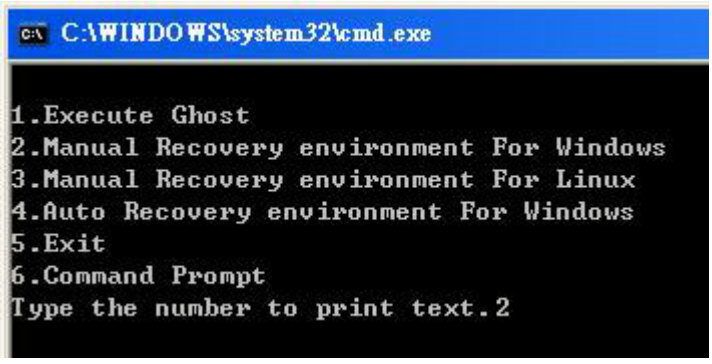


Figure A-7: System Configuration for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build a recovery partition. In this process the partition created for recovery files in **Section A.2.2** is hidden and the recovery tool is saved in this partition.

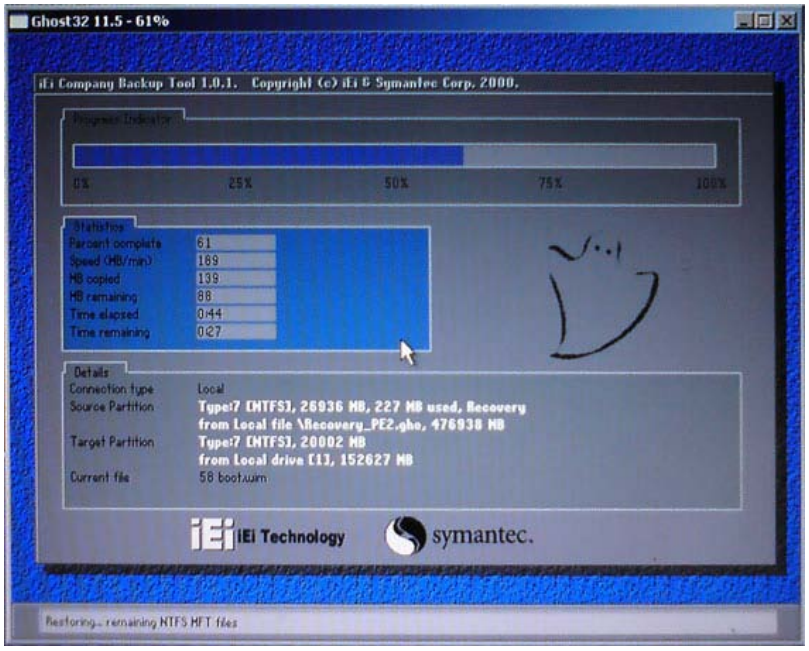


Figure A-8: Building the Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

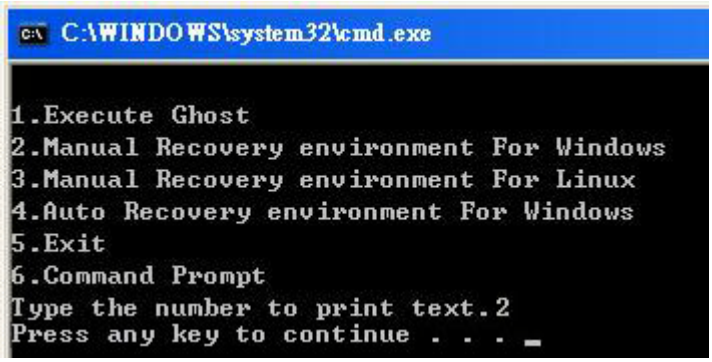


Figure A-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

A.2.5 Create Factory Default Image

NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure A-10**), press the <**F3**> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

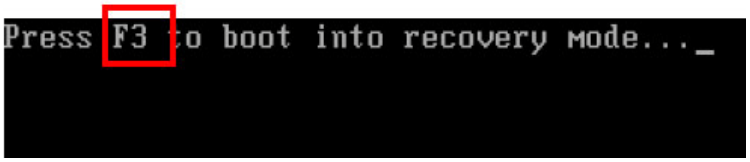


Figure A-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <**4**> and press <**Enter**>. (**Figure A-11**)

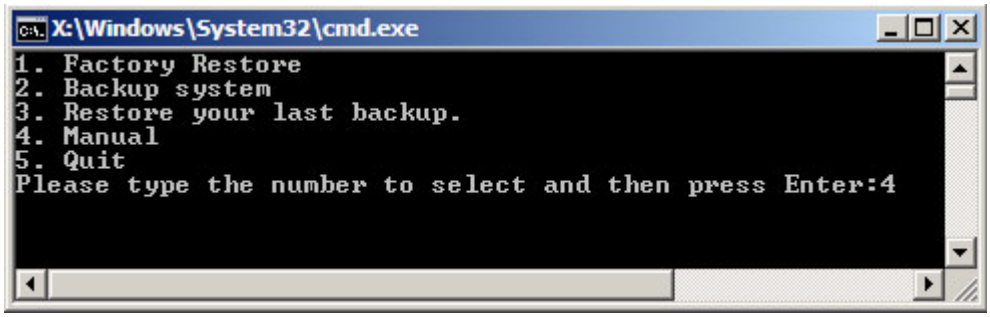


Figure A-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

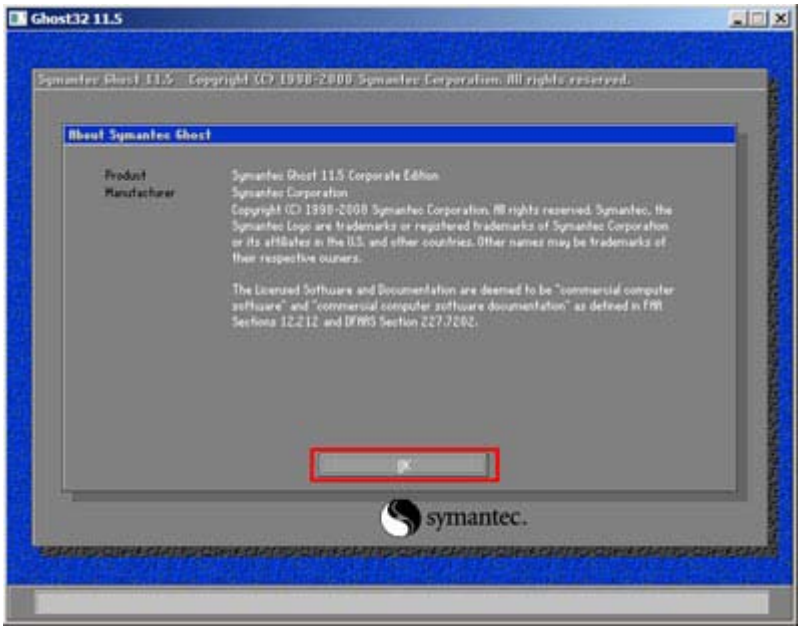


Figure A-12: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure A-13**).

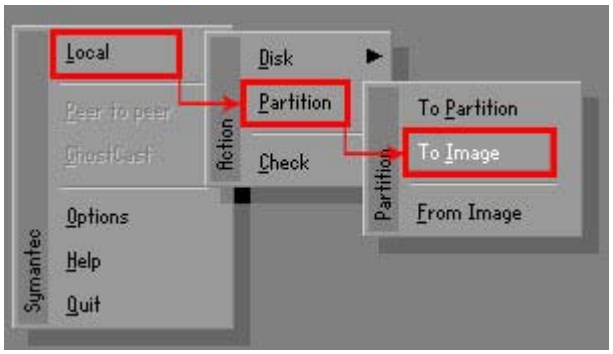


Figure A-13: Symantec Ghost Path

Step 5: Select the local source drive (Drive 1) as shown in **Figure A-14**. Then click OK.

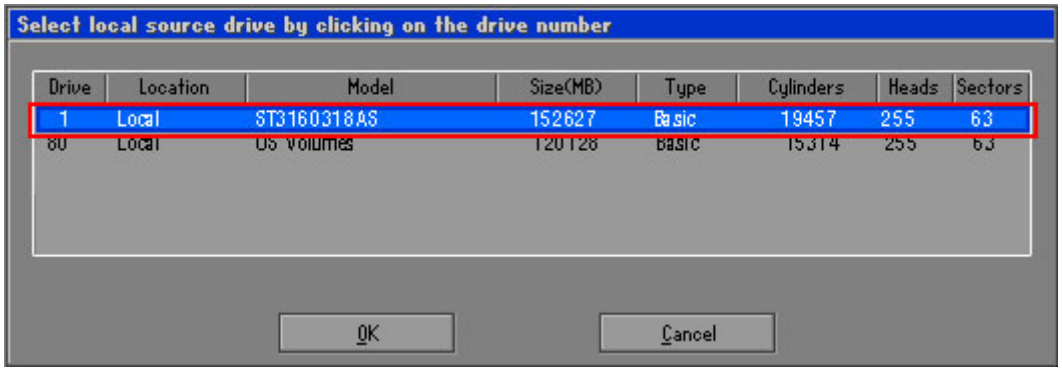


Figure A-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure A-15**. Then click OK.

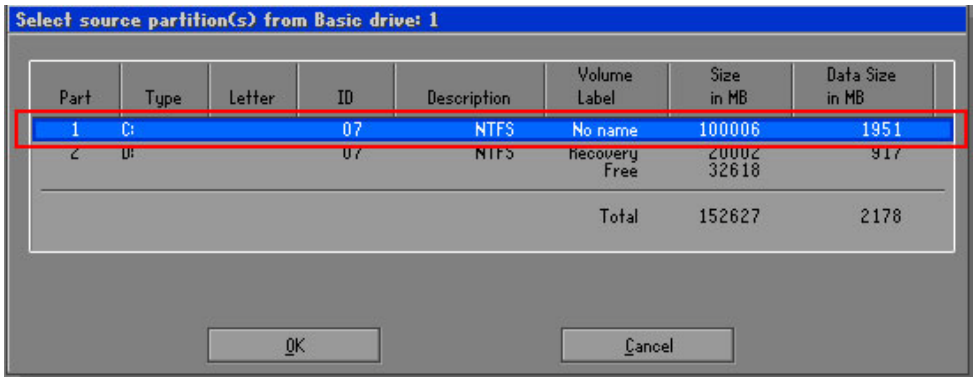


Figure A-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure A-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named IEI.GHO.

WARNING:

The file name of the factory default image must be **iei.GHO**.

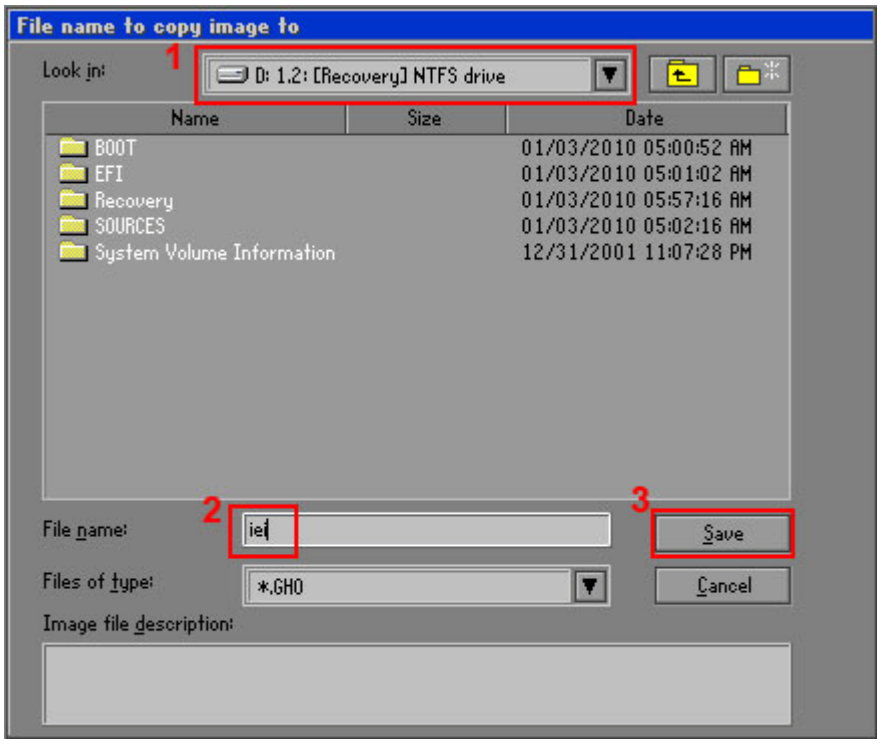


Figure A-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure A-17** prompts, click **High** to make the image file smaller.

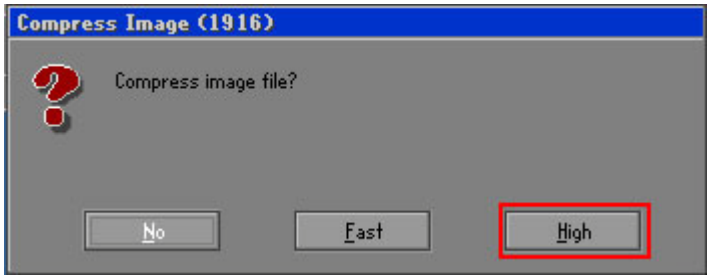


Figure A-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

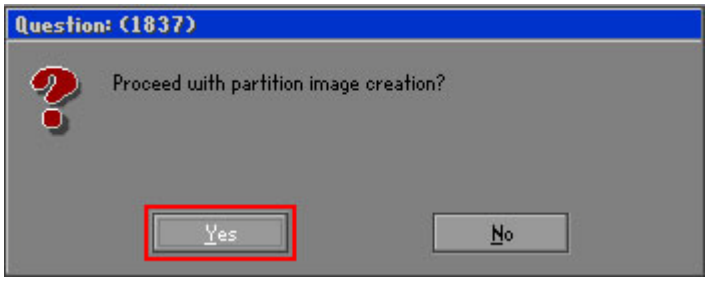


Figure A-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure A-19**).

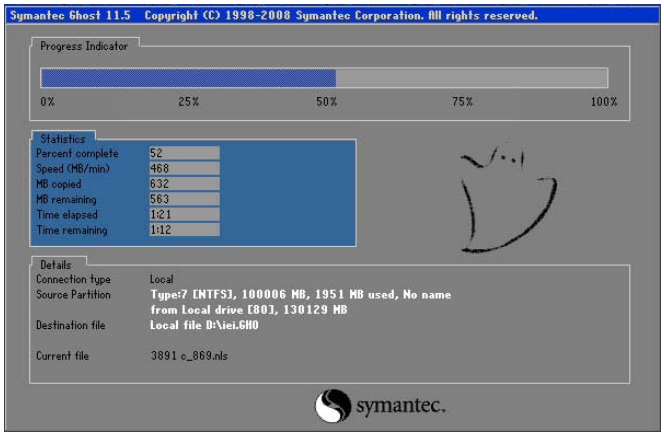


Figure A-19: Image Creation Process

Step 11: When the image creation completes, a screen prompts as shown in **Figure A-20**. Click **Continue** and close the Ghost window to exit the program.

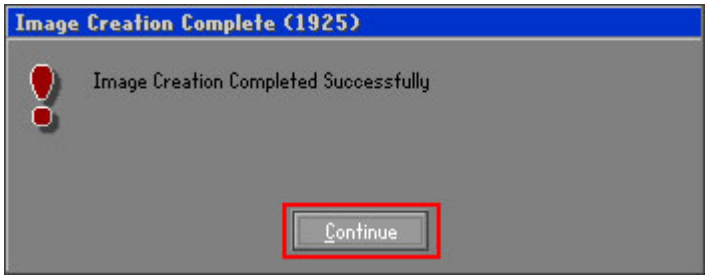


Figure A-20: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

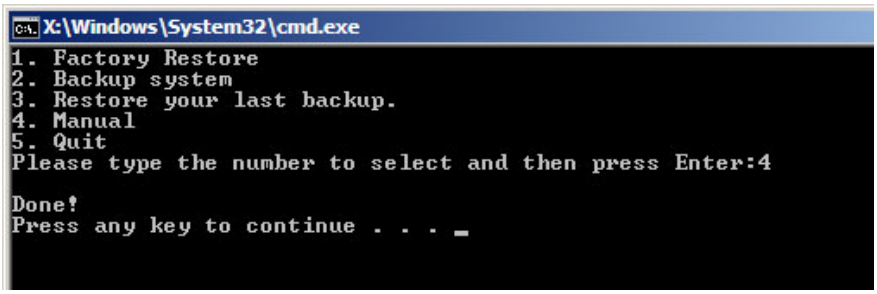


Figure A-21: Press Any Key to Continue

A.3 Auto Recovery Setup Procedure

The auto recovery function allows a system to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To use the auto recovery function, follow the steps described in the following sections.

CAUTION:

The setup procedure may include a step to create a factory default image. It is suggested to configure the system to a factory default environment before the configuration, including driver and application installations.

Step 1: Follow the steps described in **Section A.2.1 ~ Section A.2.3** to setup BIOS, create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

Figure A-22: Auto Recovery Utility

Step 3: Reboot the system from the recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

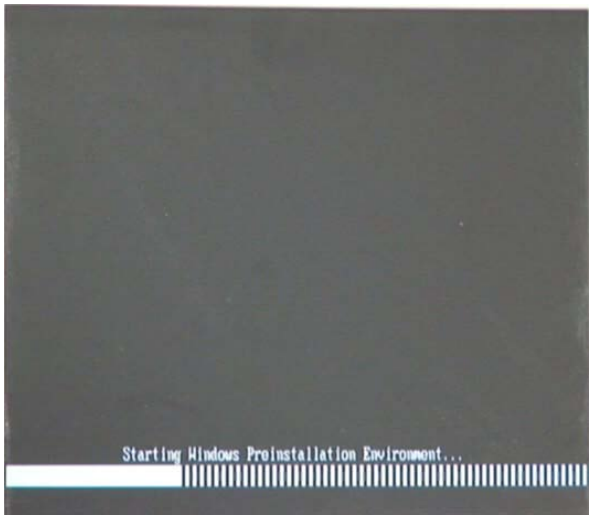


Figure A-23: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**4**> then <Enter>.

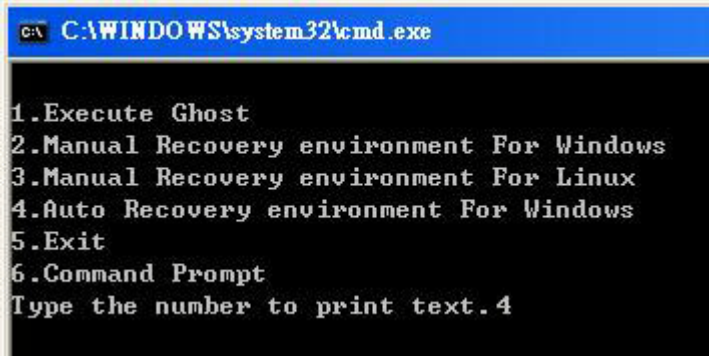


Figure A-24: Auto Recovery Environment for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build an auto recovery partition. In this process the partition created for recovery files in **Section A.2.2** is hidden and the auto recovery tool is saved in this partition.

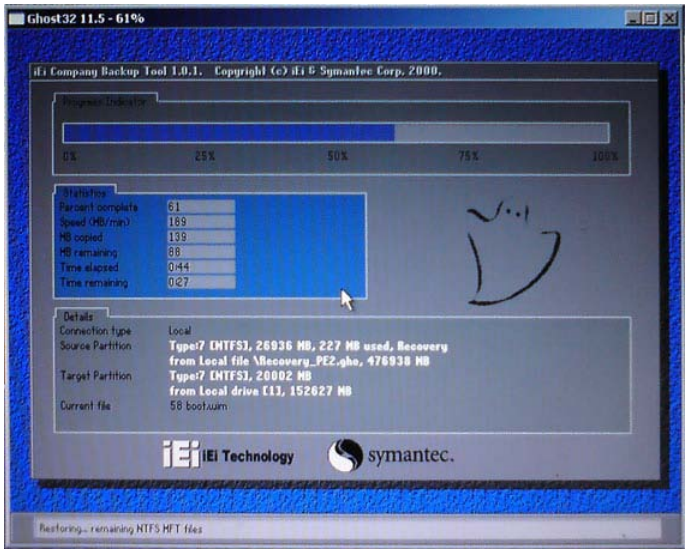


Figure A-25: Building the Auto Recovery Partition

Step 6: After completing the system configuration, the following message prompts to confirm whether to create a factory default image. Type **Y** to have the system create a factory default image automatically. Type **N** within 6 seconds to skip this process (The default option is YES). It is suggested to choose YES for this option.

Figure A-26: Factory Default Image Confirmation

Step 7: The Symantec Ghost starts to create the factory default image (**Figure A-27**).

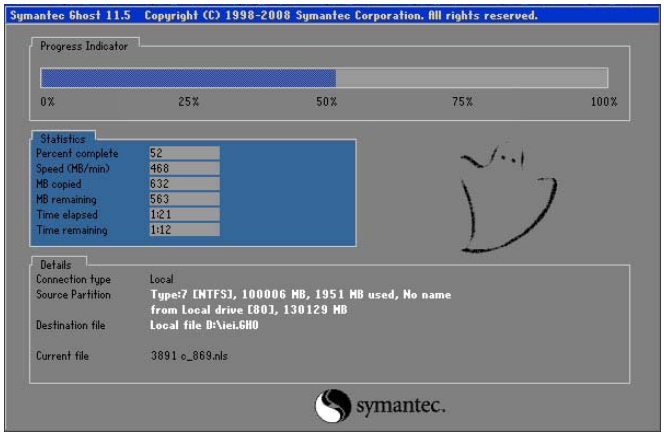


Figure A-27: Image Creation Complete

Step 8: After completing the system configuration, press any key in the following window to restart the system.

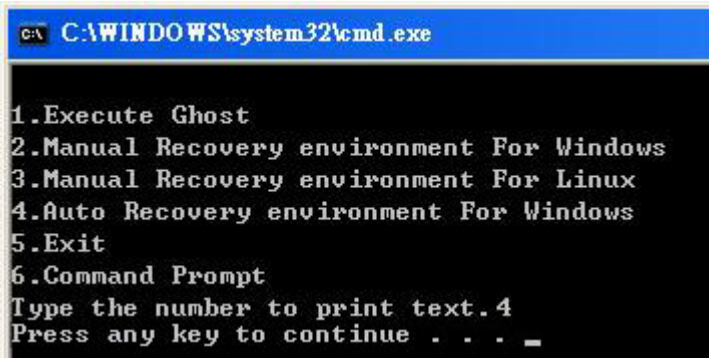
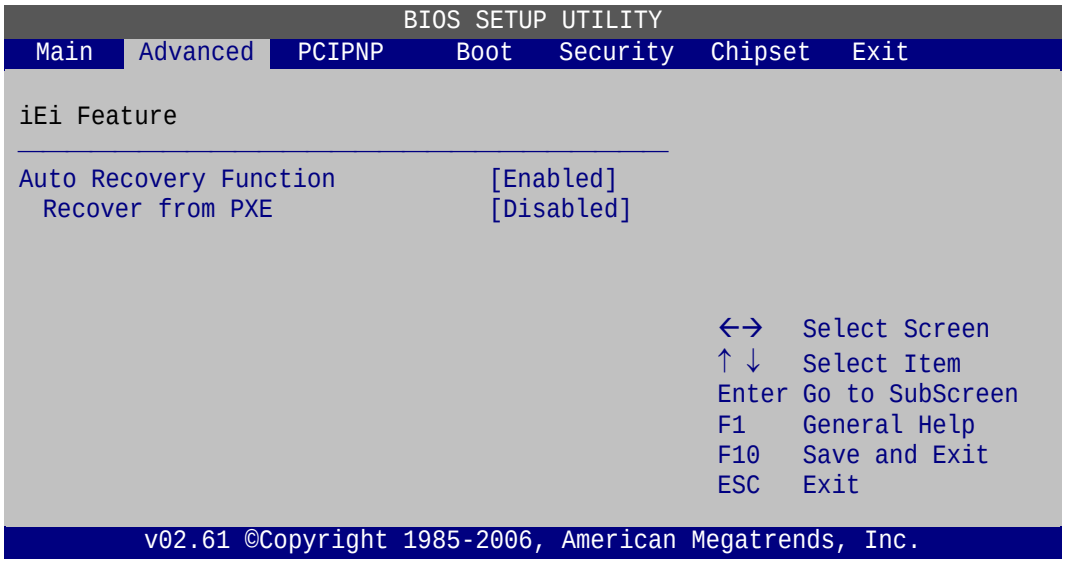


Figure A-28: Press any key to continue

Step 9: Eject the One Key Recovery CD and restart the system.

Step 10: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 11: Enable the Auto Recovery Function option (**Advanced → iEi Feature → Auto Recovery Function**).



BIOS Menu 24: IEI Feature

Step 12: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

CAUTION:

The auto recovery function can only apply on a Microsoft Windows system running the following OS versions:

- Windows XP
- Windows Vista
- Windows 7

A.4 Setup Procedure for Linux

The initial setup procedures for a Linux system are mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup the recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup**. Refer to **Section A.2.1**.

Step 2: **Install Linux operating system**. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.

NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- Partition 1: **/**
- Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.

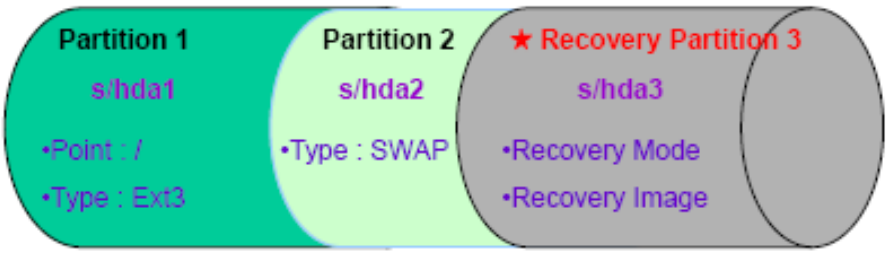


Figure A-29: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section A.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

system32>format N: /fs:ntfs /q /v:Recovery /y

system32>exit

Step 4: **Build-up recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <**3**> and press <Enter> (**Figure A-30**). The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

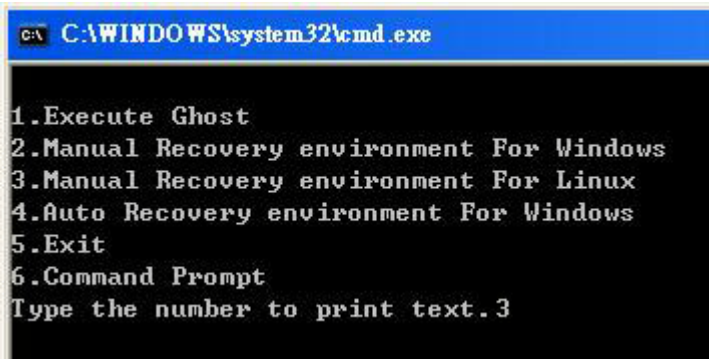


Figure A-30: Manual Recovery Environment for Linux

Step 5: **Access the recovery tool main menu by modifying the "menu.lst"**. To first access the recovery tool main menu, the menu.lst must be modified. In Linux system, enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

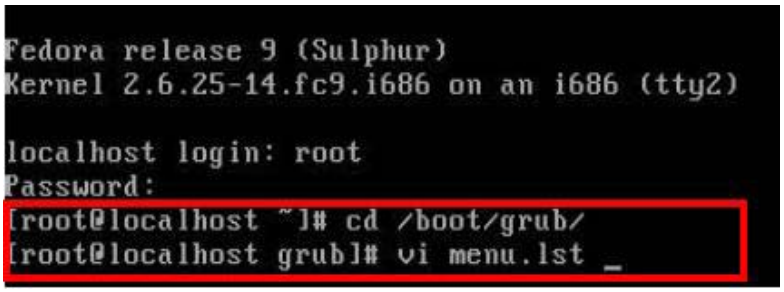
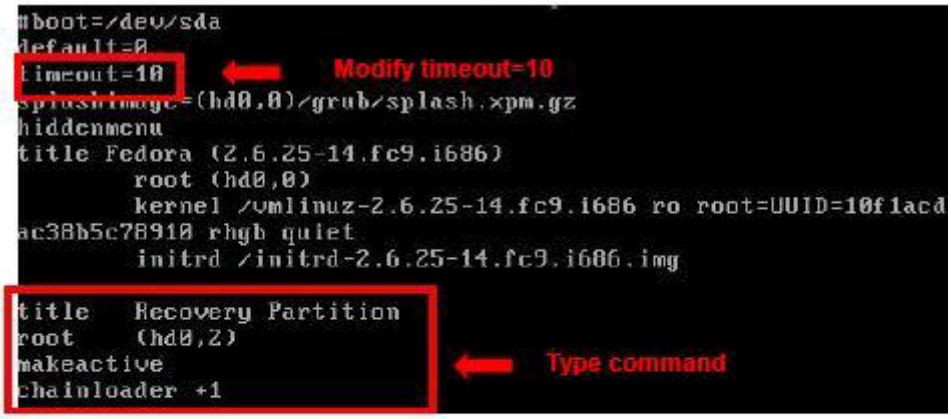


Figure A-31: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.



- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

Step 7: The recovery tool menu appears. (**Figure A-32**)

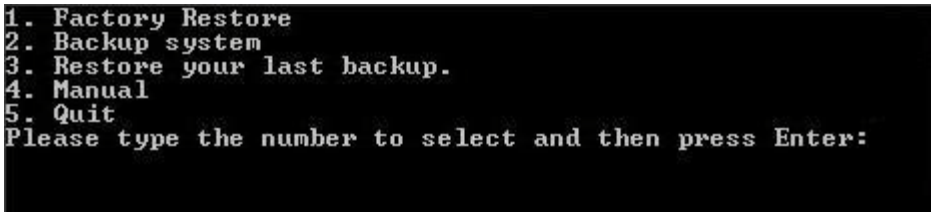

1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:

Figure A-32: Recovery Tool Menu

Step 8: **Create a factory default image**. Follow **Step 2** ~ **Step 12** described in **Section A.2.5** to create a factory default image.

A.5 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. However, if the setup procedure in Section A.3 has been completed and the auto recovery function is enabled, the system will automatically restore from the factory default image without pressing the F3 key. The recovery tool main menu is shown below.

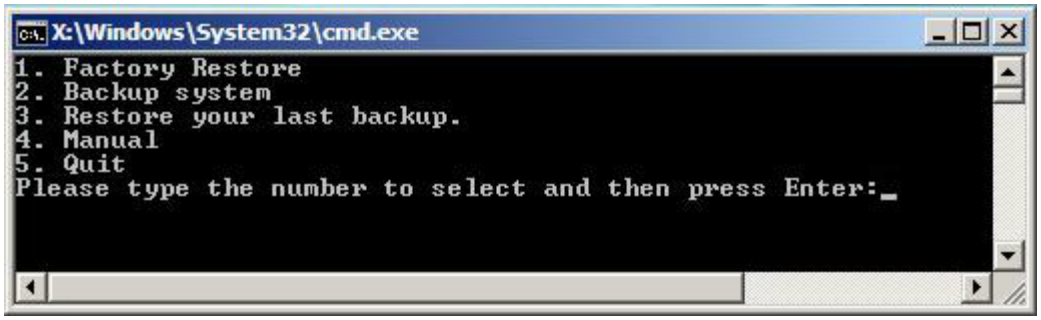


Figure A-33: Recovery Tool Main Menu

The recovery tool has several functions including:

1. Factory Restore: Restore the factory default image (iei.GHO) created in Section A.2.5.
2. **Backup system**: Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup**: Restore the last system backup image
4. **Manual**: Enter the Symantec Ghost window to configure manually.
5. **Quit**: Exit the recovery tool and restart the system.

WARNING:

Please do not turn off the system power during the process of system recovery or backup.

WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

A.5.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <**1**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

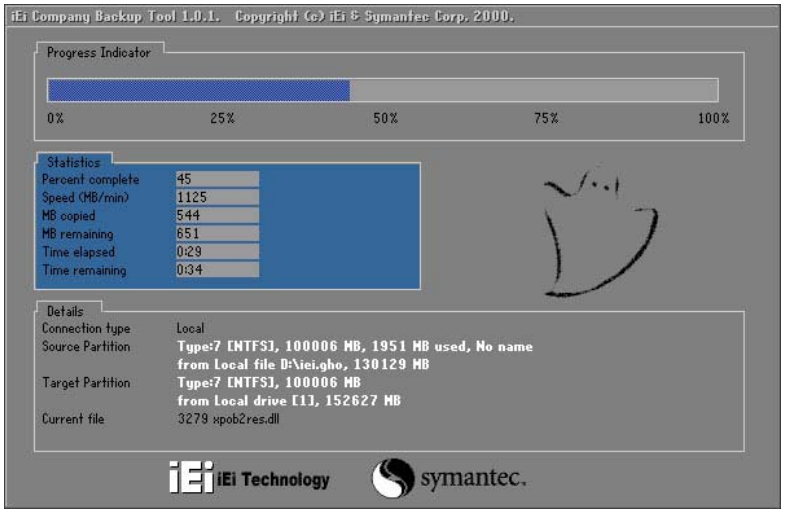


Figure A-34: Restore Factory Default

Step 3: The screen is shown as in **Figure A-35** when completed. Press any key to reboot the system.

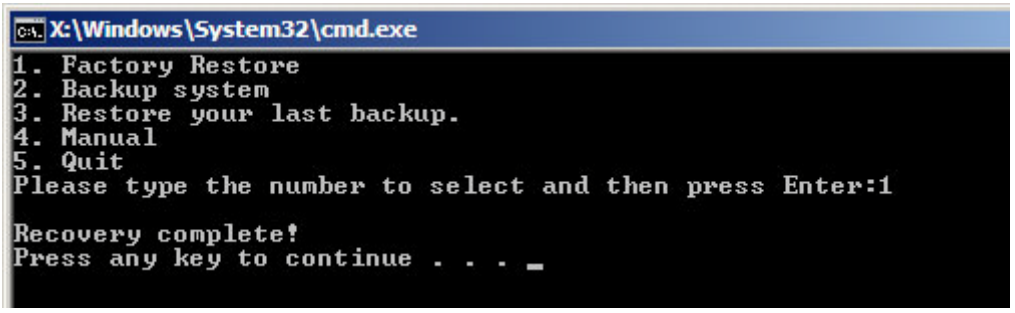

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:1
Recovery complete!
Press any key to continue . . .

Figure A-35: Recovery Complete Window

A.5.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <**2**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to backup the system. A backup image called **iei_user.GHO** is created in the hidden Recovery partition.

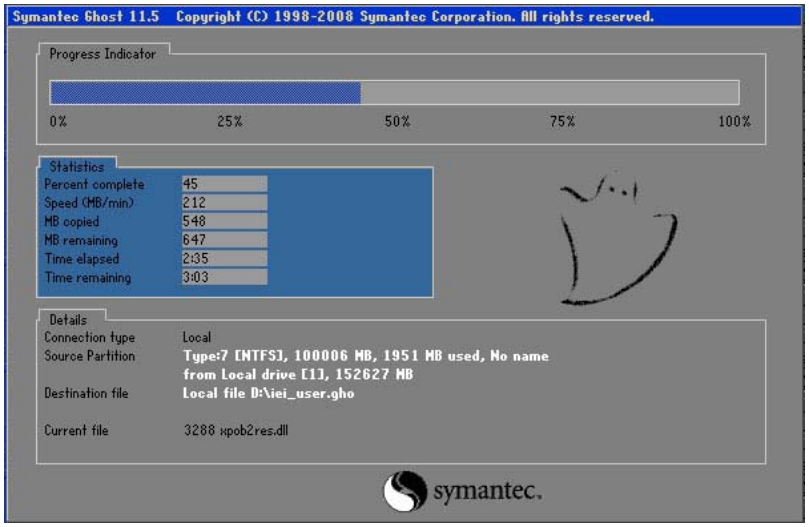


Figure A-36: Backup System

Step 3: The screen is shown as in **Figure A-37** when system backup is completed. Press any key to reboot the system.

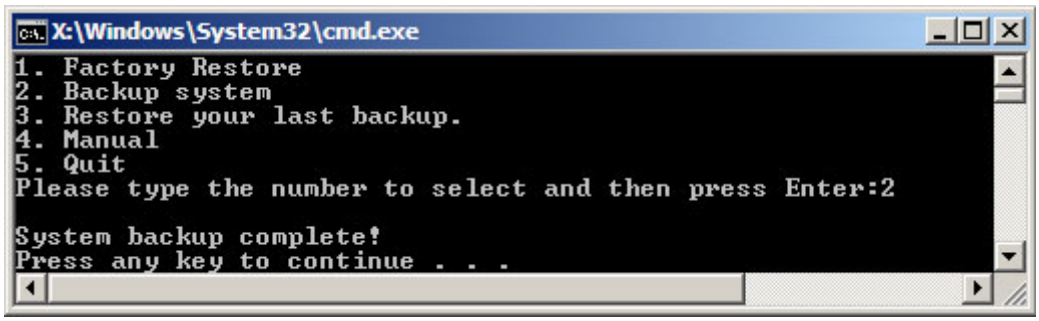

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:2
System backup complete!
Press any key to continue . . .

Figure A-37: System Backup Complete Window

A.5.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1: Type <**3**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

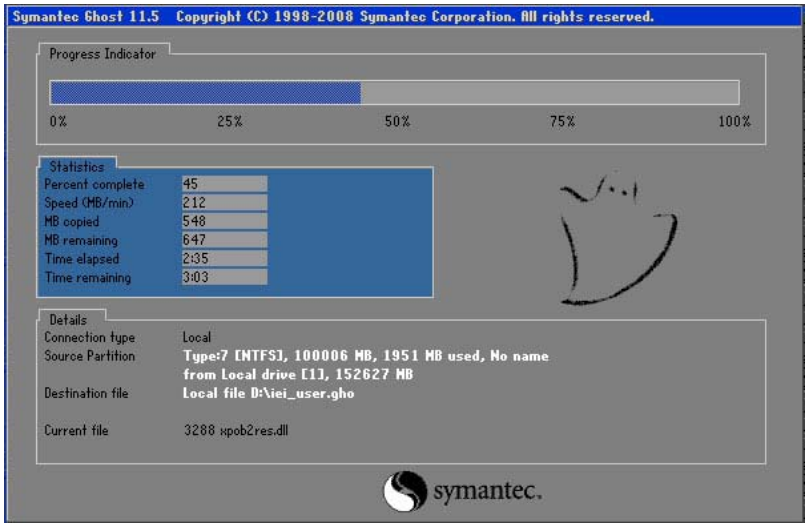


Figure A-38: Restore Backup

Step 3: The screen is shown as in **Figure A-39** when backup recovery is completed. Press any key to reboot the system.

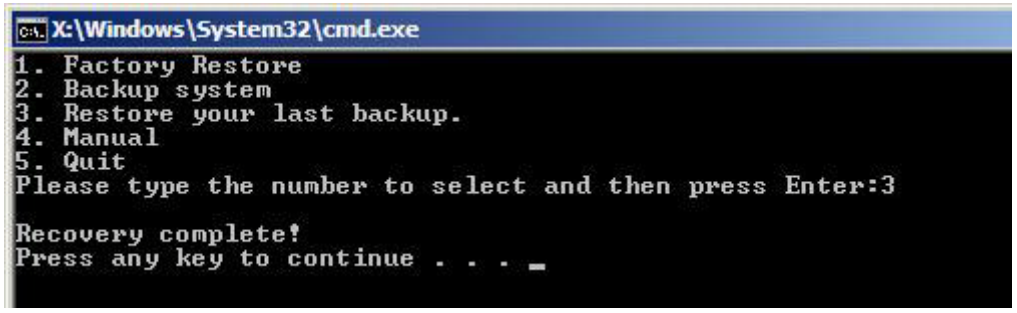

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:3
Recovery complete!
Press any key to continue . . .

Figure A-39: Restore System Backup Complete Window

A.5.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <**4**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

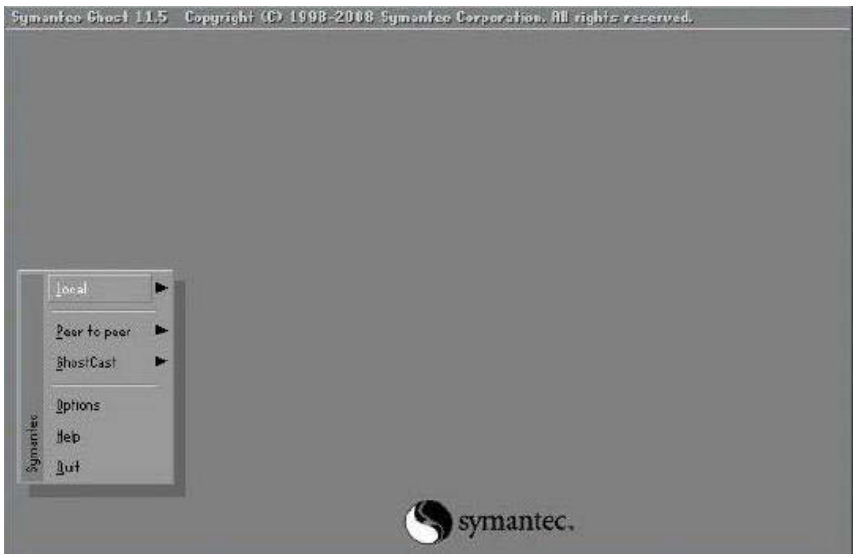
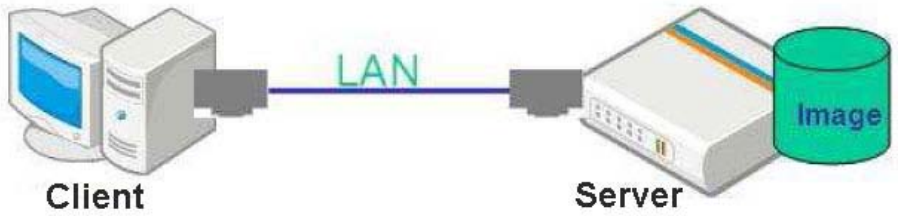


Figure A-40: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

A.6 Restore Systems from a Linux Server through LAN

The One Key Recovery allows a client system to automatically restore to a factory default image saved in a Linux system (the server) through LAN connectivity after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To be able to use this function, the client system and the Linux system MUST reside in the same domain.



NOTE:

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows CE
- Windows XP Embedded

Prior to restoring client systems from a Linux server, a few setup procedures are required.

Step 1: Configure DHCP server settings

Step 2: Configure TFTP settings

Step 3: Configure One Key Recovery server settings

Step 4: Start DHCP, TFTP and HTTP

Step 5: Create a shared directory

Step 6: Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

A.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

#yum install dhcp (CentOS, commands marked in red)

#apt-get install dhcp3-server (Debian, commands marked in blue)

Step 2: Confirm the operating system default settings: dhcpd.conf.

CentOS

Use the following command to show the DHCP server sample location:

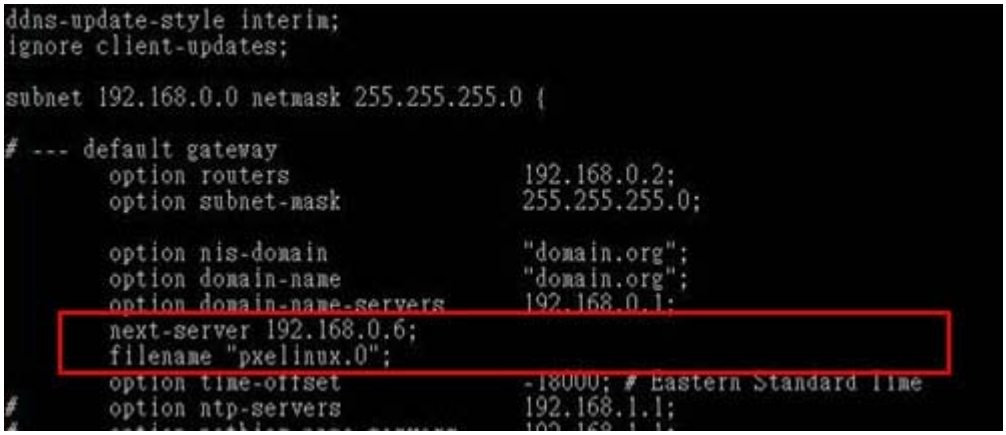
#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:

Use the following command to copy the DHCP server sample to etc/dhcpd.conf:

#cp /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample /etc/dhcpd.conf

#vi /etc/dhcpd.conf



Debian

#vi /etc/dhcpd.conf

Edit “/etc/dhcpd.conf” for your environment. For example, add

next-server PXE server IP address;

filename “pxelinux.0”;

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {

# --- default gateway
        option routers                  192.168.0.2;
        option subnet-mask              255.255.255.0;

        option nis-domain               "domain.org";
        option domain-name              "domain.org";
        option domain-name-servers      192.168.0.1;
        next-server 192.168.0.6;
        filename "pxelinux.0";
        option time-offset              -18000; # Eastern Standard Time
#       option ntp-servers              192.168.1.1;
```

A.6.2 Configure TFTP Settings

Step 1: Install the tftp, httpd and syslinux.

#yum install tftp-server httpd syslinux (CentOS)

#apt-get install tftpd-hpa xinetd syslinux (Debian)

Step 2: Enable the TFTP server by editing the “/etc/xinetd.d/tftp” file and make it use the remap file. The “-vvv” is optional but it could definitely help on getting more information while running the remap file. For example:

CentOS

#vi /etc/xinetd.d/tftp

Modify:

disable = no

server_args = -s /tftpboot –m /tftpboot/tftpd.remap -vvv_

```
        socket_type             = dgram
        protocol                = udp
        wait                    = yes
        user                    = root
        server                  = /usr/sbin/in.tftpd
        server_args             = -s /tftpboot -m /tftpboot/tftpd.remap -vvv
        disable                 = no
        per_source              = 11
        cps                     = 100 2
        flags                   = IPv4
```

Debian

Replace the TFTP settings from “inetd” to “xinetd” and annotate the “inetd” by adding “#”.

#vi /etc/inetd.conf

Modify: #tftp dgram udp wait root /usr/sbin..... (as shown below)

```
#:BOOT: TFTP service is provided primarily for booting.  Most sites
#       run this only on machines acting as "boot servers."

#tftp           dgram   udp     wait    root  /usr/sbin/in.tftpd /usr/sbin/in.tftpd -s
 /var/lib/tftpboot
```

#vi /etc/xinetd.d/tftp

```
        socket_type             = dgram
        protocol                = udp
        wait                    = yes
        user                    = root
        server                  = /usr/sbin/in.tftpd
        server_args             = -s /tftpboot -m /tftpboot/tftpd.remap -vvv
        disable                 = no
        per_source              = 11
        cps                     = 100 2
        flags                   = IPv4
```

A.6.3 Configure One Key Recovery Server Settings

Step 1: Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key Recovery CD to the system (server side).

Step 2: Extract the recovery package to /.

#cp RecoveryR10.tar.bz2 /

#cd /

#tar –xvjf RecoveryR10.tar.bz2

Step 3: Copy “pxelinux.0” from “syslinux” and install to “/tftboot”.

#cp /usr/lib/syslinux/pxelinux.0 /tftpboot/

A.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

#service xinetd restart

#service httpd restart

#service dhcpd restart

Debian

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

#/etc/init.d/dhcp3-server restart

A.6.5 Create Shared Directory

Step 1: Install the samba.

#yum install samba

Step 2: Create a shared directory for the factory default image.

#mkdir /share

#cd /share

#mkdir /image

#cp iei.gho /image

WARNING:

The file name of the factory default image must be **iei.gho**.

Step 3: Confirm the operating system default settings: smb.conf.

#vi /etc/samba/smb.conf

Modify:

[image]

comment = One Key Recovery

path = /share/image

browseable = yes

writable = yes

public = yes

create mask = 0644

directory mask = 0755

Step 4: Edit "/etc/samba/smb.conf" for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
   security = share
```

```
[image]
   comment = One Key Recovery
   path = /share/image
   browseable = yes
   writable = yes
   public = yes
   create mask = 0644
   directory mask = 0755
```

Step 5: Modify the hostname

#vi /etc/hostname

Modify: RecoveryServer

```
RecoveryServer
~
```

A.6.6 Setup a Client System for Auto Recovery

Step 1: Configure the following BIOS options of the client system.

Advanced → iEi Feature → Auto Recovery Function → **Enabled**

Advanced → iEi Feature → Recover from PXE → **Enabled**

Boot → Launch PXE OpROM → **Enabled**

Step 2: Continue to configure the **Boot Option Priorities** BIOS option of the client system:

Boot Option #1 → remain the default setting to boot from the original OS.

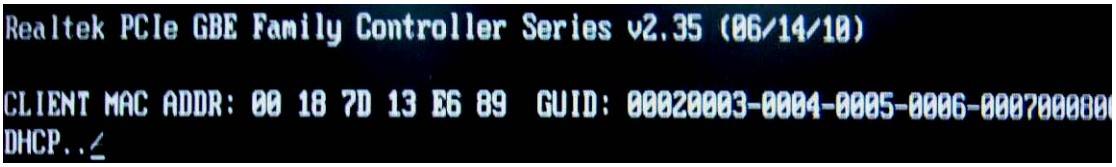
Boot Option #2 → select the boot from LAN option.

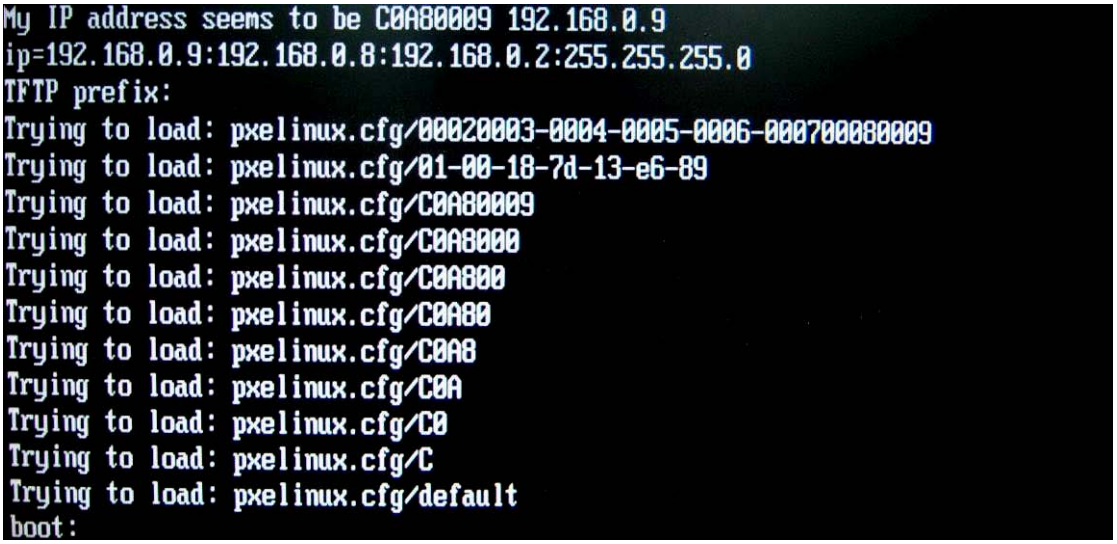
Step 3: Save changes and exit BIOS menu.

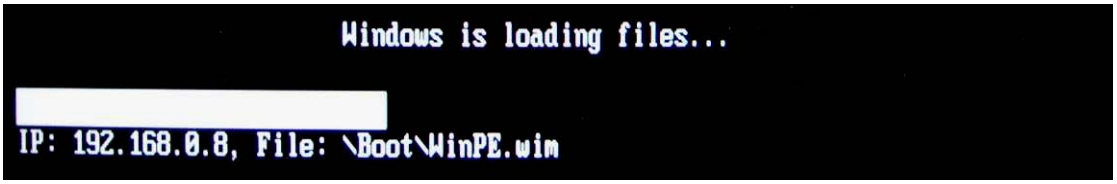
Exit → **Save Changes and Exit**

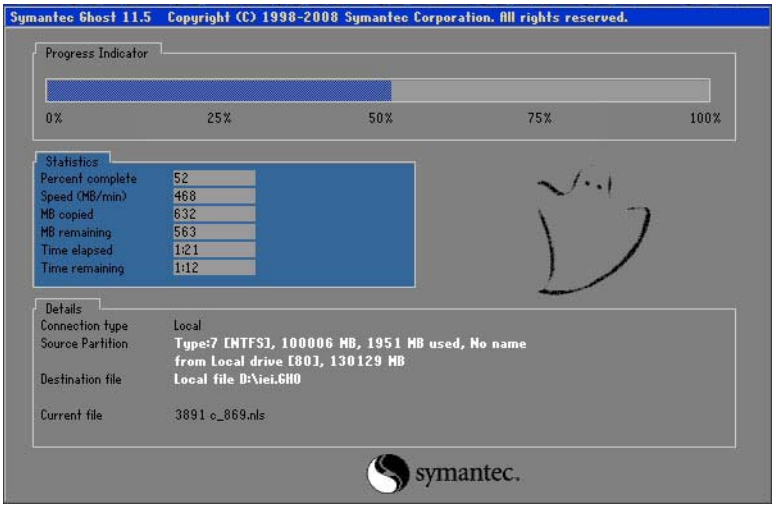
Step 4: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

Step 5: Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.


Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)
CLIENT MAC ADDR: 00 18 7D 13 E6 89 GUID: 00020003-0004-0005-0006-000700000
DHCP..







NOTE:

A firewall or a SELinux is not in use in the whole setup process. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

A.7 Other Information

A.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

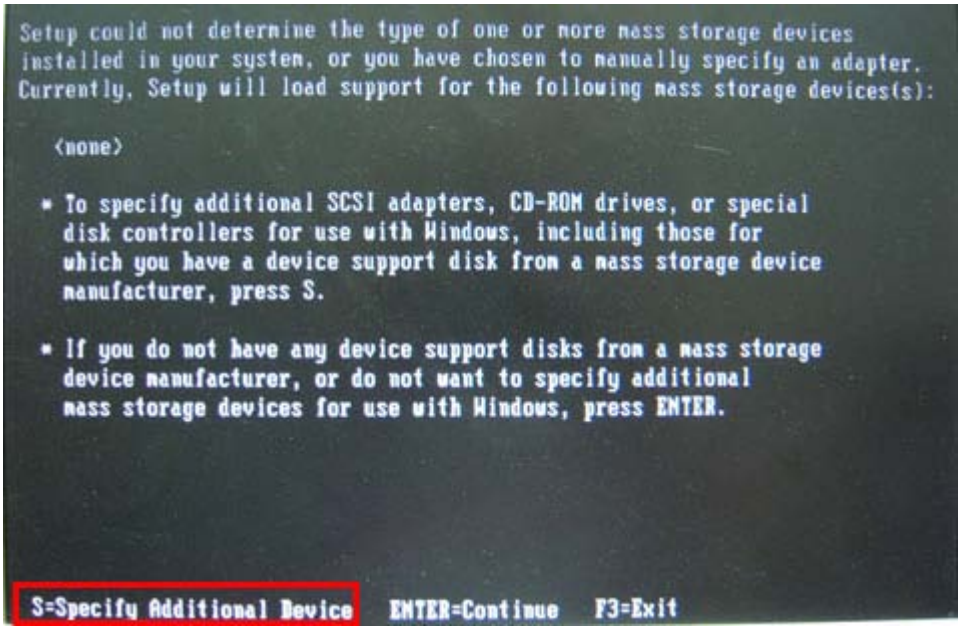
Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

Step 2: Connect the USB floppy disk drive to the system.

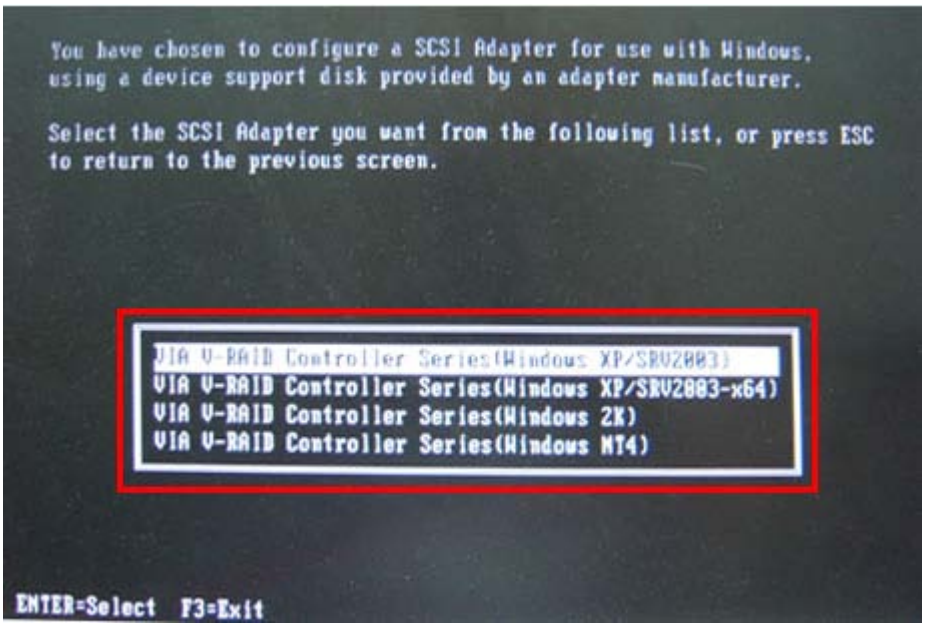
Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

Step 4: When launching the recovery tool, press <**F6**>.

Step 5: When the following window appears, press <**S**> to select “Specify Additional Device”.


Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Device
ENTER=Continue
F3=Exit

Step 6: In the following window, select a SATA controller mode used in the system. Then press <**Enter**>. The user can now start using the SATA HDD.


You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.
VIA V-RAID Controller Series(Windows XP/SRV2003)
VIA V-RAID Controller Series(Windows XP/SRV2003-x64)
VIA V-RAID Controller Series(Windows 2K)
VIA V-RAID Controller Series(Windows NT4)
ENTER=Select
F3=Exit

Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section A.2.2 Create Partitions** to finish the whole setup process.

A.7.2 System Memory Requirement

To be able to access the recovery tool by pressing <**F3**> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS**: 128 MB system memory
- **Using AMI BIOS**: 512 MB system memory.

Appendix

B

Safety Precautions

B.1 Safety Precautions

WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the TANK-720.

Please follow the safety precautions outlined in the sections that follow:

B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

B.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the TANK-720 may result in permanent damage to the TANK-720 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-720. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-720 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

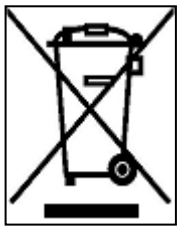
B.1.3 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-720, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-720, please read the details below.

- The interior of the TANK-720 does not require cleaning. Keep fluids away from the TANK-720 interior.

- Be cautious of all small removable components when vacuuming the TANK-720.
- Turn the TANK-720 off before cleaning the TANK-720.
- Never drop any objects or liquids through the openings of the TANK-720.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-720.
- Avoid eating, drinking and smoking within vicinity of the TANK-720.

B.2.2 Cleaning Tools

Some components in the TANK-720 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the TANK-720.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-720.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-720.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the TANK-720 as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the TANK-720. Dust and dirt can restrict the airflow in the TANK-720 and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

Hazardous Materials Disclosure

C.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						